

UNITED STATES DISTRICT COURT  
SOUTHERN DISTRICT OF NEW YORK

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:  
J. MARK LANE and JAMES SEARS, :

Plaintiffs, :

- against - :

STEVEN G. JAMES, in his official capacity as :  
Acting Superintendent of the New York State :  
Police, and MIRIAM E. ROCAH, in her official :  
capacity as District Attorney for the County of :  
Westchester, New York, :

Defendants. :  
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Case No. 22 Civ. 10989 (KMK)

**DECLARATION OF**  
**PROFESSOR LOUIS KLAREVAS**

Pursuant to 28 U.S.C. § 1746, I, Louis Klarevas, declare and state as follows:

1. I have been asked to render an opinion by the Office of the Attorney General of New York on the ownership and use of assault weapons in the United States.

2. This declaration is based on my own personal knowledge, research, and experience, and if I am called to testify as a witness, I could and would testify competently to the truth of the matters discussed in this declaration.

**I. PROFESSIONAL QUALIFICATIONS**

3. I am a security policy analyst and, currently, Research Professor at Teachers College, Columbia University, in New York. I am also the author of the book *Rampage Nation*, one of the most comprehensive studies on gun massacres in the United States.<sup>1</sup> I am a political scientist by training, with a B.A. from the University of Pennsylvania and a Ph.D. from American University. While my early career focused on the intersection of public opinion surveys and national security, my current research examines the nexus between American public safety and gun violence, including serving as an investigator in a study funded by the National Institutes of Health that is focused on reducing intentional shootings at elementary and secondary schools.

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<sup>1</sup> Louis Klarevas, *Rampage Nation: Securing America from Mass Shootings* (2016).

4. During the course of my nearly 25-year career as an academic, I have served on the faculties of George Washington University, the City University of New York, New York University, and the University of Massachusetts. I have also served as Defense Analysis Research Fellow at the London School of Economics and Political Science and as United States Senior Fulbright Scholar in Security Studies at the University of Macedonia.

5. In addition to having made well over 100 media and public-speaking appearances, I am the author or co-author of more than 25 scholarly publications and over 70 commentary pieces. In 2019, my peer-reviewed article on the effectiveness of restrictions on large-capacity magazines in reducing high-fatality mass shootings resulting in six or more victims killed was published in the *American Journal of Public Health*.<sup>2</sup> This study found that jurisdictions with large-capacity magazine bans experienced substantially lower gun massacre incidence and fatality rates when compared to jurisdictions not subject to similar bans. Despite being five years old, this study continues to be one of the highest-impact studies in all of academia. It was recently referred to as “the perfect gun policy study,” in part due to the study’s “robustness and quality.”<sup>3</sup>

6. In the past five years (since January 1, 2019), I have been deposed, testified in court, or testified by declaration in the following cases (all in federal court), listed alphabetically by state:

**California – Central District**

*Rupp v. Bonta*

8:17-cv-00746-JLS-JDE

**California – Eastern District**

*Wiese v. Bonta*

2:17-cv-00903-WBS-KJN

**California – Southern District**

*Duncan v. Bonta*

17-cv-1017-BEN-JLB

*Jones v. Bonta*

19-cv-01226-L-AHG

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<sup>2</sup> Louis Klarevas et al., “The Effect of Large-Capacity Magazine Bans on High-Fatality Mass Shootings,” 109 *American Journal of Public Health* 1754 (2019).

<sup>3</sup> Lori Ann Post and Maryann Mason, “The Perfect Gun Policy Study in a Not So Perfect Storm,” 112 *American Journal of Public Health* 1707 (2022). According to Post and Mason, “Klarevas et al. employed a sophisticated modeling and research design that was more rigorous than designs used in observational studies. Also, they illustrated the analytic steps they took to rule out alternative interpretations and triangulate their findings, for example examining both state bans and federal bans. They helped build the foundation for future studies while overcoming the limitations of previous research.” *Id.*

**California – Southern District (Cont.)**

*Miller v. Bonta* 3:19-cv-1537-BEN-JBS  
*Nguyen v. Bonta* 3:20-cv-02470-WQH-MDD

**Colorado**

*Gates v. Polis* 1:22-cv-01866-GPG-SKC  
*Rocky Mountain Gun Owners v. Town of Superior* 1:22-cv-02680-NYW-SKC

**Connecticut**

*National Association for Gun Rights v. Lamont* 3:22-cv-01118-JBA  
*Grant v. Lamont* 3:22-cv-01223-JBA

**Hawaii**

*National Association for Gun Rights v. Lopez* 1:22-cv-404-DKW-RT

**Illinois – Northern District**

*Viramontes v. Cook County* 1:21-cv-04595  
*National Association for Gun Rights v. Highland Park* 22-cv-04774  
*Herrera v. Raoul* 1:23-cv-00532  
*Kenneally v. Raoul* 3:23-cv-50039

**Illinois – Southern District**

*Harrel v. Raoul*<sup>\*</sup> 23-cv-141-SPM  
*Langley v. Kelly*<sup>\*</sup> 23-cv-192-SPM  
*Barnett v. Raoul*<sup>\*</sup> 23-cv-209-SPM  
*Federal Firearms Licensees of Illinois v. Pritzker*<sup>\*</sup> 23-cv-215-SPM

**Massachusetts**

*National Association for Gun Rights v. Campbell* 1:22-cv-11431-FDS

**New York – Southern District**

*Lane v. James* 22 Civ. 10989 (KMK)

**Oregon**

*Oregon Firearms Federation v. Kotek*<sup>†</sup> 2:22-cv-01815-IM  
*Fitz v. Rosenblum*<sup>†</sup> 3:22-cv-01859-IM  
*Eyre v. Rosenblum*<sup>†</sup> 3:22-cv-01862-IM  
*Azzopardi v. Rosenblum*<sup>†</sup> 3:22-cv-01869-IM

**Washington – Eastern District**

*Brumback v. Ferguson* 1:22-cv-03093-MKD

*Banta v. Ferguson* 2:23-cv-00112-MKD

**Washington – Western District**

*Sullivan v. Ferguson* 3:22-cv-5403-DGE

*Hartford v. Ferguson* 3:23-cv-05364-RJB

\*Non-Consolidated Cases on the Same Briefing Schedule / †Consolidated Cases

7. In 2021, I was retained by the Government of Canada in the following cases which involved challenges to Canada’s regulation of certain categories of firearms: *Parker and K.K.S. Tactical Supplies Ltd. v. Attorney General of Canada*, Federal Court, Court File No.: T-569-20; *Canadian Coalition for Firearm Rights, et al. v. Attorney General of Canada*, Federal Court, Court File No.: T-577-20; *Hipwell v. Attorney General of Canada*, Federal Court, Court File No.: T-581-20; *Doherty, et al. v. Attorney General of Canada*, Federal Court, Court File No.: T-677-20; *Generoux, et al. v. Attorney General of Canada*, Federal Court, Court File No.: T-735-20; and *Eichenberg, et al. v. Attorney General of Canada*, Federal Court, Court File No.: T-905-20. I testified under oath in a consolidated court proceeding involving all six cases in the Federal Court of Canada.

8. I have also submitted declarations in the following state court cases: *People of Colorado v. Sgaggio*, District Court, El Paso County, Colorado, 2022M005894 (Criminal); *Guardian Arms v. State of Washington*, Superior Court, Thurston County, Washington, 23-2-01761-34 (Civil); and *State of Washington v. Gator’s Custom Guns*, Superior Court, Cowlitz County, Washington, 23-2-00897-08 (Civil).

9. A true and correct copy of my current curriculum vitae is attached as **Exhibit A** to this declaration.

10. I have been retained by the State Defendants to render expert opinions in this case. I am being compensated at a rate of \$600/hour for my work on this declaration.

## II. OPINIONS

11. Based upon my extensive review and analysis of the material cited in this declaration, I have come to the following professional conclusions on the ownership and use of assault weapons:

- a. *Data Sources on the Circulation and Ownership of Assault Weapons Are Problematic.* Most sources that have attempted to gauge circulation and ownership of modern sporting rifles are methodologically flawed and, therefore, unreliable. The bottom line is that the number of assault weapons in circulation or that are personally owned by American gun owners is unknown. As such, the circulation and ownership rates for assault weapons are indeterminable. One aspect of firearm circulation and ownership that is known with reasonable certainty is that handguns are the most common type of firearm in circulation and personally owned—not rifles, and most certainly not rifles that qualify as assault weapons.
- b. *Unlike Circulation and Ownership Data Sources, There Are Multiple Reliable and Valuable Data Sources on the Use of Assault Weapons.* While assault weapons are used to perpetrate violent crime, particularly the murder of police officers, their most prominent criminal use appears to be to perpetrate multiple-victim shootings. Mass shootings resulting in double-digit fatalities are relatively modern phenomena in American history, related to the use of assault weapons and large-capacity magazines. In the present era, mass shootings pose a significant—and growing—threat to American public safety. In particular, mass shootings involving assault weapons, on average, have resulted in a substantially larger loss of life than similar incidents that did not involve assault weapons. Most mass shootings now involve assault weapons, which serve as force multipliers associated with higher average death tolls when used. Relatedly, jurisdictions that restrict assault weapons experience fewer mass shooting incidents and fatalities, per capita, than jurisdictions that do not restrict assault weapons. Comparing offensive to defensive uses shows that assault weapons are used by civilians with a far greater frequency to perpetrate mass shootings than to stop mass shootings. Indeed, in terms of defensive gun uses, in general, the quintessential firearm used by the majority of gun owners appears to be the handgun. This may even be the case for owners of AR-15-style rifles, who appear to use handguns, not rifles, in the majority of their defensive gun uses.

## III. CIRCULATION AND OWNERSHIP OF ASSAULT WEAPONS

12. Based on national survey data, we can approximate that roughly three-in-ten adults (aged 18 or over) in the United States personally own at least one firearm. Two recent surveys, in particular, collected data that help us approximate how many firearms are privately owned by American adults. According to a Harvard University survey, 28.8% of individuals aged 18 or over

personally own at least one firearm.<sup>4</sup> Given the 2023 U.S. Census estimate that the adult population is approximately 262.1 million people, this suggests that about 75.5 million American adults are presently gun owners. The Harvard survey also found that the (mean) average number of guns personally owned by respondents who identified as gun owners is 4.6 firearms.<sup>5</sup> This suggests that, currently, there are approximately 347.3 million firearms that are privately owned by American adults. Similarly, a recent Gallup poll found that 30.0% of American adults personally own a (mean) average of 4.9 firearms.<sup>6</sup> This suggests that there are approximately 78.6 million adults who privately own approximately 385.1 million firearms. As these two bounds are not far apart, a reasonable working mean average can be calculated: *approximately 366.2 million personally-owned firearms in the possession of approximately 77.1 million adults in the United States.*<sup>7</sup>

13. According to the National Shooting Sports Foundation (NSSF), the trade association for the firearms industry, in terms of the share of firearms by category (handguns, rifles, and shotguns) between 1990 and 2021, the distribution of the domestic stock is dominated by handguns, which make up 54% of all firearms produced for the U.S. market (see Figure 1). A similar pattern exists with the distribution of personally-owned firearms held by American adults. According to the recent Harvard University survey, handguns are the predominant firearm personally owned, followed by rifles and then shotguns (see Figure 2).<sup>8</sup> Regardless of the metric—domestic stock or personal firearms privately owned—handguns are the most common firearms.

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<sup>4</sup> Matthew Miller, Wilson Zhang, and Deborah Azrael, “Firearm Purchasing During the COVID-19 Pandemic: Results from the 2021 National Firearms Survey,” 175 *Annals of Internal Medicine* 219 (2022).

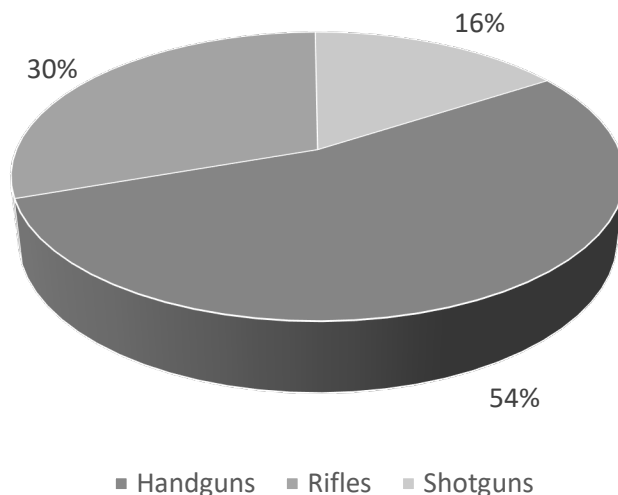
<sup>5</sup> *Id.*

<sup>6</sup> Jeffrey M. Jones, “Majority in U.S. Continues To Favor Stricter Gun Laws,” Gallup, October 31, 2023, available at <https://news.gallup.com/poll/513623/majority-continues-favor-stricter-gun-laws.aspx>.

<sup>7</sup> A survey of gun owners conducted by Georgetown University professor William English in 2021 found that 81.4 million American adults personally own firearms. A review of the survey data indicates that these 81.4 million firearm owners possess an average of 5.9 guns. William English, “2021 National Firearms Survey: Updated Analysis Including Types of Firearms Owned,” Unpublished Paper (May 13, 2022; Revised September 22, 2022), at 7, available at [https://papers.ssrn.com/sol3/cf\\_dev/AbsByAuth.cfm?per\\_id=4283305](https://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=4283305). As discussed below in greater detail, there are ethical and methodological concerns about this survey and Professor English’s analysis of the survey data that render these estimates questionable and, therefore, unreliable.

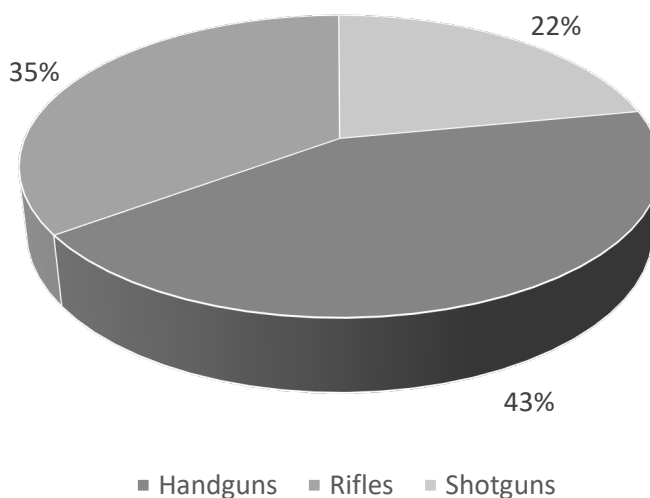
<sup>8</sup> The survey of gun owners conducted by Georgetown University professor William English in 2021 also found that handguns make up the predominant share of personally-owned firearms. English, *supra* note 7, at 20-21. However, the underlying survey data show the distribution to be 41% handguns, 35% rifles, and 24% shotguns. Again,

**Figure 1. Breakdown of All Firearms in the Domestic Stock of Firearms (by Category)**



Source: NSSF, *Firearm Production in the United States with Firearm Import and Export Data, 2023 Edition* (2024), at 16.

**Figure 2. Breakdown of Personally-Owned Firearms in the United States (by Category)**



Source: Matthew Miller, Wilson Zhang, and Deborah Azrael, “Firearm Purchasing During the COVID-19 Pandemic: Results from the 2021 National Firearms Survey,” 175 *Annals of Internal Medicine* 219 (2022).

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as discussed below in greater detail, there are ethical and methodological concerns about this survey and Professor English’s analysis of the survey data that render these estimates questionable and, therefore, unreliable.

14. Like firearms in general, assault weapons also fall into three categories: handguns, rifles, and shotguns.<sup>9</sup> Occasionally, people advance arguments about the possession and use of assault weapons using proxy variables. The use of such proxies involves significant limitations. For instance, those who pursue this line of reasoning rely on circulation as part of the domestic stock of firearms (akin to manufacturing and importation data) or personal ownership of firearms by private civilians as proxies for how exactly firearms are used. However, gun use, in the active sense, generally involves discharging or brandishing firearms—activities that are not reflected in circulation and ownership statistics.

15. Another type of proxy analysis involves the employment of what the firearms industry refers to as “modern sporting rifles” (MSRs)—which is a term used inconsistently to mean different things, but often as a reference to AR-platform and AK-platform semiautomatic rifles—as a proxy for assault weapons. There are two significant limitations with using MSRs, defined this way, as a proxy for assault weapons. First, rifles are not the only assault weapons. Focusing on rifles overlooks pistols and shotguns that are assault weapons. Second, when MSRs are used to refer to firearms that are not AR- and AK-platform rifles as assault weapons, it could result as some MSRs not qualifying as assault weapons under different relevant laws. Some MSRs are manufactured to be compliant with state restrictions on assault weapons. By statutory definition, these MSRs are not assault weapons. Indeed, as will be discussed below, if NSSF estimates are accurate, it would mean that all 2,034,000 MSRs estimated by the NSSF to have entered into the domestic stock between 1995 and 2004, when the federal Assault Weapons Ban prohibited the manufacture and importation of assault weapons, would not have been assault weapons under the

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<sup>9</sup> While the term “assault weapon” as referenced in the present case is defined by statute, the modern-day roots of the term can be traced back to the 1980s, when gun manufacturers branded military-style firearms with the label in an effort to make them more marketable to civilians. *See*, Violence Policy Center, *Assault Weapons and Accessories in America* (1988); Violence Policy Center, *Bullet Hoses: Semiautomatic Assault Weapons—What Are They? What’s So Bad about Them?* (2003); Phillip Peterson, *Gun Digest Buyer’s Guide to Assault Weapons* (2008); and Erica Goode, “Even Defining ‘Assault Rifles’ Is Complicated,” *New York Times*, January 16, 2013, available at <https://www.nytimes.com/2013/01/17/us/even-defining-assault-weapons-is-complicated.html>.



federal law.<sup>10</sup> Therefore, relying on MSRs as a proxy for assault weapons necessarily results in a misestimation of the number of assault weapons in circulation.

16. Keeping the above cautionary guidance in mind, it can be stated with a reasonable degree of certainty that the number of assault weapons in circulation in the United States is unknown. The number of personally-owned assault weapons in the possession of private civilians is also unknown. As such, the circulation and ownership rates for assault weapons are indeterminable.

### ***IIIA. The English Survey***

17. In 2021, Georgetown University professor William English conducted a survey of gun owners (“the English survey” hereinafter).<sup>11</sup> One of the survey’s objectives was to collect data on the ownership of what the questionnaire described as “AR-15 style rifles and other semi-automatic rifles, which are sometimes referred to as ‘assault weapons.’”<sup>12</sup> According to Professor English’s analysis of the underlying poll data, he concluded that 30.2% of gun owners have, at some point in their lives, owned an AR-15-style rifle.<sup>13</sup> Using a slightly higher baseline than this declaration’s working average (81.4 million gun owners as opposed to 77.1 million gun owners), Professor English calculated that 30.2% of this group would amount to 24.6 million people.<sup>14</sup> According to his analysis, “This suggests that up to 44 million AR-15 styled rifles have been owned by U.S. gun owners.”<sup>15</sup> However, the English survey posed the ownership question in the past tense, making it impossible to probe the current ownership of AR-15-style rifles.

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<sup>10</sup> For NSSF estimates of the number of MSRs to enter the domestic stock during the decade that the federal Assault Weapons Ban was in effect, *see*, NSSF, *Firearm Production in the United States with Firearm Import and Export Data, 2023 Edition* (2024), at 7.

<sup>11</sup> The underlying data of the 2021 survey conducted by Professor English have been made available to the general public. The data is archived in spreadsheet format in the following source: William English, “2021 National Firearms Survey,” version 1, Harvard Dataverse, 2023, available at <https://dataverse.harvard.edu/dataset.xhtml?persistentId=doi:10.7910/DVN/58TXW6>. Unless stated otherwise, all analyses that I have performed on the English survey data have drawn on the publicly release data set available at the Harvard Dataverse.

<sup>12</sup> English, *supra* note 7, at 33.

<sup>13</sup> *Id.*

<sup>14</sup> *Id.*

<sup>15</sup> *Id.*

18. In addition to this limitation related to an odd choice in question wording, there are several ethical and methodological concerns with the English survey that raise suspicions about the underlying data and Professor English's analysis of the data. Ethically, the survey runs afoul of the standards of practice of the American Association for Public Opinion Research (AAPOR).<sup>16</sup> To begin with, Professor English has never disclosed all sources of funding used to conduct and analyze the survey, which is a clear violation of AAPOR canons.<sup>17</sup> Disclosing survey sponsorship is vital to assuring that the survey was not designed or conducted to further the political or economic interests of particular entities. Moreover, while Professor English has released the raw, unweighted results of his survey, he has not released his weighted results, which might constitute a failure to properly disclose all survey results that were used for purposes of analysis.<sup>18</sup> Finally, by misleadingly informing survey participants that this was a survey on outdoor recreational activities, the survey might have used a deceptive practice to lure gun owners into taking the survey, which might also be a violation of AAPOR ethical standards.<sup>19</sup>

19. Besides ethical concerns, the survey also suffers from methodological issues. First, some of the survey questions are worded in a manner that suggests a negative framing of regulations on firearms and magazines. When conducting opinion polls, question wording matters. Subtly cueing respondents to perceive regulations in an unfavorable manner runs the risk of producing biased results, in turn, rendering survey results unreliable.<sup>20</sup> Second, as most surveys conducted by national polling organizations do, the English survey used a methodology known as weighting to estimate the number of overall gun owners. However, throughout the analysis of the poll data, Professor English often reported results using unweighted data. As the English survey,

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<sup>16</sup> The AAPOR Code of Professional Ethics and Practices is available at <https://aapor.org/standards-and-ethics/#aapor-code-of-professional-ethics-and-practices>.

<sup>17</sup> *Id.*, Section IIIA2.

<sup>18</sup> *Id.*, Section IIIB.

<sup>19</sup> *Id.*, Section IIIA4.

<sup>20</sup> For a quick overview of public opinion polling, including how question wording and question order can affect the answers provided by respondents, see Roper Center for Public Opinion Research, "Polling Fundamentals," Cornell University, 2024, available at <https://ropercenter.cornell.edu/polling-and-public-opinion/polling-fundamentals>. See, also, Norman M. Bradburn, Seymour Sudman, and Brian Wansink, *Asking Questions: The Definitive Guide to Questionnaire Design—For Market Research, Political Polls, and Social and Health Questionnaires*, Revised Edition (2004).

initially, was not demographically representative of gun owners (e.g., it was over-representative of female gun owners and gun owners under 26 years of age and under-representative of male gun owners and gun owners over 65 years of age), relying on unweighted results can produce skewed, unreliable findings.<sup>21</sup>

20. There are also concerns pertaining to the portions of the survey that probed AR-15-style rifle ownership. As already mentioned, ownership questions were asked in the past tense, making it impossible to gauge current ownership rates. Another problem with the analysis of AR-15-style rifle ownership statistics is that Professor English arbitrarily excluded any responses that indicated they had owned over 100 AR-15-style rifles. This was reportedly done for the following reason: “In order to provide a conservative estimate of ownership rates and to ensure that average estimates are not skewed by a small number of large outliers, we disregard the 0.3% that indicate owning over 100 in calculating average ownership numbers.”<sup>22</sup> There is no reason to exclude these respondents, nor does Professor English cite any source from the public opinion research literature to support such a seemingly arbitrary decision. As a result of excluding what he labels as “outliers,” Professor English buries one of the most striking findings in the survey: a tiny number of gun owners have owned the majority of AR-15-style rifles. After excluding two of the respondents for providing what were apparently false answers claiming to own, respectively, 1 million and 69,420 AR-15-style rifles, a review of the remaining data indicates that Professor English excluded only 12 data points (out of 2,234 AR-15-style-rifle data points).<sup>23</sup> This, too, may seem trivial at first glance.<sup>24</sup> However, those 0.5% of respondents account for ownership of 37.1% of all AR-15-style

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<sup>21</sup> For an overview of weighting that is written in a manner accessible to lay people, see, Andrew Mercer, Arnold Lau, and Courtney Kennedy, “How Different Weighting Methods Work,” Pew Research Center, January , 2018, available at <https://www.pewresearch.org/methods/2018/01/26/how-different-weighting-methods-work>. It should be noted that surveying a sample of respondents that is not demographically representative of the population is not necessarily a serious defect in the survey, as corrective measures like weighting might be able to address this.

<sup>22</sup> English, *supra* note 7, at 33.

<sup>23</sup> Excluding unrealistic responses is an acceptable practice in survey analysis. See, for example, Miller, Zhang, and Azrael, *supra* note 4.

<sup>24</sup> Based on my evaluation of the English survey data set, 2,193 respondents indicated that they owned a total of 9,049 AR-15-style rifles. I then added the figures provided in 39 narrative responses, which indicated those particular respondents owned at least one such rifle, into the numerical tallies: 35 identified one rifle, 1 identified 2 rifles, 1 identified 3 rifles, 1 identified “30+” rifles (which was coded as 31 rifles), and 1 identified “100+” rifles (which was coded as 101 rifles). I also accounted for 2 additional narrative responses that answered that they owned

rifles.<sup>25</sup> When the respondents who owned more than 10 AR-15-style rifles are separated from those who have owned 10 or less, the data indicates that 59.0% of AR-15-style rifles have been owned by just 4.3% of AR-15-style rifle owners. If the English survey results are accurate, this would indicate that AR-15-style rifles are largely concentrated in the hands of a fraction of all AR-15-style rifle owners, let alone all gun owners.

21. Given suspicions about the integrity and findings of the English survey, there is a good basis to consider the underlying survey data as well as the subsequent unpublished analysis performed by Professor English unreliable.<sup>26</sup>

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none. This increased the data set to 2,234 respondents who indicated that they owned a combined total of 9,221 AR-15-style rifles.

<sup>25</sup> Professor English claims that he only excluded 0.3% of responses. In his words, “Approximately 99.7 indicated owning under 100 and 98.4% under 10.... Among those who indicate having owned AR-15 and similarly styled rifles, they indicate having owned an average of 1.8, with the median owner having owned 1. This suggests that up to 44 million AR-15 styled rifles have been owned by U.S. gun owners.” English, *supra* note 7, at 33. The problem with the above assertions is that the English survey data do not allow for a reproduction of these figures. For instance, whether or not one includes the 41 narrative responses (totaling 172 rifles), after excluding the two extreme (and apparently false) responses, the data appear to show that the number of gun owners who indicated that they have owned over 100 AR-15-style rifles equals 0.5%, not 0.3%. Because Professor English does not explain his calculations in his analysis, it is unclear how he calculated this so-called “outlier” group to be 0.3%. These discrepancies further challenge the accuracy and reliability of the analysis performed by Professor English. In particular, reproducibility—taking the identical data provided by someone else, subjecting those data to the same computational steps or code, and coming up with identical results—is a hallmark of science. See, for example, National Academies of Science, Engineering, and Medicine, *Reproducibility and Replicability in Science* (2019). When studies cannot be reproduced, there is good reason to be suspicious of their purported findings and conclusions.

<sup>26</sup> Professor English also interpreted some of his findings in a manner that appears to be a speculative attempt to make sense of those findings, which calls into the question the reliability of his survey and subsequent analyses. In one example, respondents were asked if they ever found themselves in a situation “in which it would have been useful for defensive purposes to have a firearm with a magazine capacity in excess of 10 rounds.” English, *supra* note 7, at 26-28. Professor English reports that approximately 550 respondents answered this question in the affirmative. *Id.*, at 28. Over 10% of Professor English’s unpublished paper is allocated to reproducing, verbatim, 31 select answers to this question. Presumably, the 31 reproduced answers are the ones that Professor English felt were the most instructive as to the utility of LCMs in self-defense situations. Out of these 31 scenarios, *only two* involved an armed citizen actually firing his or her firearm, and in *only one* of these two scenarios did the respondent confirm that they fired more than 10 rounds. Neither scenario involved self-defense against a criminal. Instead, both involved the use of gunfire to ward off animals: in one instance a bear and in another a pack of coyotes. Taking situations that involved driving away from the potential threat or having their dog chase away the criminals and interpreting them as examples that reflect *the usefulness of LCMs* for purposes of self-defense, is unfounded. Relatedly, while Professor English reported that there were approximately 550 respondents who provided answers in the affirmative, he failed to report that 4,257 survey participants provided a response to this question, and the majority of the answers were in the negative. *Id.*, at 28-33. In another example, Professor English reports the percentage of gun owners who have owned LCMs in each state. The state with the highest rate of LCM ownership is the District of Columbia, with 69.2% of D.C. respondents reporting that they have owned LCMs. *Id.*, at 27. This is a surprising finding because the District of Columbia has the strictest prohibitions on LCMs in the U.S. See, for example, Giffords Law Center to Prevent Gun Violence, “Large-Capacity Magazines,” available at <https://giffords.org/lawcenter/gun-laws/policy-areas/hardware-ammunition/large-capacity-magazines>. Intuitively, the District of Columbia should be one of the states with the lowest LCM ownership rates. To make sense of this baffling finding, Professor English provided some possible explanations:

### ***IIIB. NSSF Publications***

22. In 2024, the NSSF published a table that estimates the number of “modern sporting rifles” (MSRs) that came into circulation as part of the domestic stock in the United States on an annual basis (these estimates are reproduced in Table 1, second column). According to the NSSF, between 1990 and 2021, an estimated 28.1 million MSRs entered the domestic market.<sup>27</sup> Again, this is not the number believed to be personally owned by private civilians, which would be a subset of the overall domestic stock. The 28.1 million estimate necessarily includes MSRs in the possession of law enforcement and security agencies, firearm wholesalers and retailers, firearm instruction centers, shooting ranges and gun clubs, prohibited owners (such as criminals and domestic abusers), as well as MSRs that have been illegally trafficked to other countries and those that have been lost, decommissioned (including due to deterioration), or destroyed. As discussed earlier, it appears to also include MSRs that would not qualify as assault weapons in jurisdictions that currently restrict assault weapons.

23. The NSSF’s estimate cannot be verified because the underlying data and formula used to calculate the figure have not been made available by the NSSF. According to the NSSF, the source data for the number of MSRs entering the U.S. market annually since 1990 come from “ATF AFMER, US ITC, [and] Industry Reporting.” The problem with this claim is that neither the ATF nor the ITC track MSRs. The Bureau of Alcohol, Tobacco, Firearms, and Explosives

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(1) LCM owners were including magazines that they keep in another state or that are legal to possess because they are “grandfathered” and (2) states with low gun ownership rates “such as DC and Hawaii” are more likely to have a higher concentration of “gun enthusiasts.” However, Professor English offered no evidence that LCM owners in the District of Columbia store their LCMs in other states (not to mention that neighboring Maryland also restricts LCM possession). Nor did Professor English offer any evidence that there is a higher concentration of gun enthusiasts in Washington, D.C. And, the “grandfathering” theory can be ruled out because the District of Columbia does not grandfather LCMs. English, *supra* note 7, at 25-26.

<sup>27</sup> NSSF, *supra* note 10. The NSSF does not estimate how many MSRs entered the domestic firearms market prior to 1990. However, one analysis of rifle serial numbers estimates that, from 1963 when the manufacture of AR-rifles commenced until 1994 when the federal Assault Weapons Ban took effect, there were at least 787,144 AR-platform firearms produced in the U.S. See General Staff, “Estimating AR-15 Production, 1964-2017,” November 9, 2019, available at [https://www.generalstaff.org/Firearms/Count/AR15\\_Production.htm](https://www.generalstaff.org/Firearms/Count/AR15_Production.htm). Per NSSF’s estimate, 287,000 MSRs were produced in the U.S. from 1990-1994. Subtracting the NSSF’s 287,000 estimate from the larger 787,000 estimate suggests that a total of approximately 500,000 MSRs were produced domestically prior to 1990. This calculation assumes that NSSF’s 287,000 estimate is accurate. However, given that the NSSF does not provide a detailed accounting of how it calculated its MSR estimates, the accuracy of the NSSF’s estimates is open to question.

(ATF) does produce a report known as the Annual Firearms Manufacturers and Export Report (AFMER). As the title of this report indicates, this is an annual report of how many guns are manufactured in the U.S. and how many guns are exported to other countries. ATF AFMER data are broken down by category, particularly handguns, rifles, and shotguns. The International Trade Commission maintains separate data on firearms imported in the U.S. Neither the ATF nor the ITC maintain data specific to MSRs. As such, there is no way to discern the number of MSRs in circulation from either of these U.S. government sources. Using the process of elimination, any determinations as to the number of MSRs in circulation made by the NSSF would necessarily be the result of consulting industry sources that have not been shared by the NSSF. As a result, the NSSF's estimate is unverifiable.<sup>28</sup>

24. While the accuracy of the NSSF's chart on MSR production cannot be confirmed, if we assume it is accurate, a clear pattern emerges. The number of MSRs in circulation prior to the expiration of the Federal Assault Weapons Ban in 2004 accounted for no more than 10% of the estimated 28.1 million cumulative stock (Table 1, last column). Indeed, over half of the estimated cumulative stock did not come into circulation until 2016—a mere six years prior to the estimated culmination of 28.1 million MSRs (Table 1, last column). Furthermore, the NSSF estimates that 13% of all MSRs since 1990 entered the domestic market in one single year: 2021 (Table 1, last column). In other words, if the NSSF estimates are correct, then over half of the stock of MSRs entered the domestic market in just a six-year period. In which case, the prior 26 years accounted for less than 50% of the overall number of MSRs that entered the domestic market (Figure 3).

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<sup>28</sup> In addition to reproducibility, another hallmark of science is replicability—finding fairly consistent outcomes across different studies using their own unique data. National Academies of Science, Engineering, and Medicine, *supra* note 25. The NSSF's claims regarding the number of MSRs cannot be either reproduced or replicated. This calls into question the NSSF's estimates, in turn, rendering the NSSF chart on "Modern Sporting Rifle Production in the United States, 1990-2021," unreliable. The chart is published in NSSF, *supra* note 10, at 7.

**Table 1. NSSF Estimate of MSRs Entering the Domestic Stock of Firearms Compared to All Firearms Entering the Domestic Stock of Firearms, Annually and Cumulatively, 1990-2021**

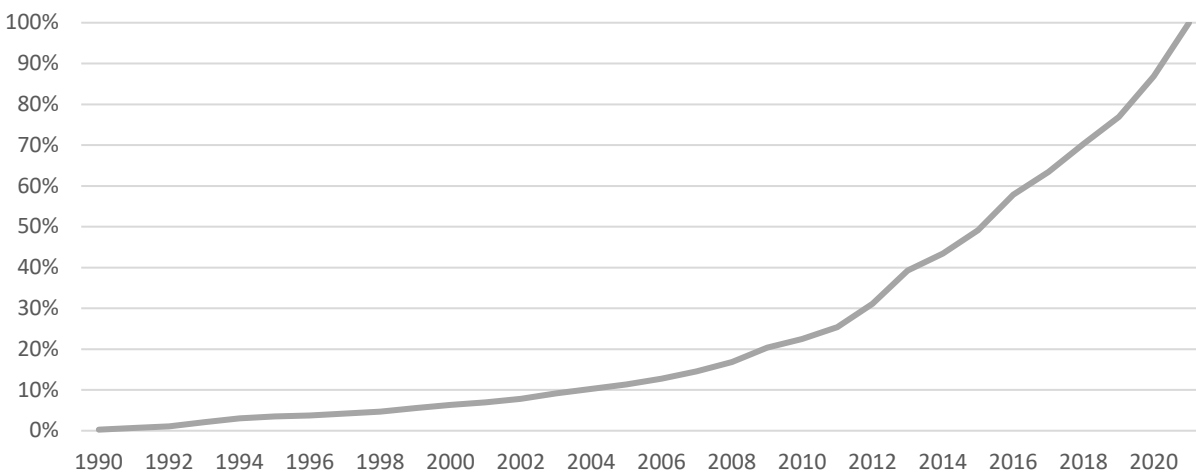
Year	MSRs (Annual NSSF Estimate)	All Firearms (Annual)	% MSRs (Annual)	Cumulative MSRs (Annual NSSF Estimate)	Cumulative Firearms (Annual)	% Cumulative MSRs (Annual)	Cumulative MSRs (Annual) as Share of Cumulative MSRs (Total)
1990	74,000	4,468,112	2%	74,000	4,468,112	2%	<1%
1991	115,000	4,145,349	3%	189,000	8,613,461	2%	1%
1992	105,000	5,248,760	2%	294,000	13,862,221	2%	1%
1993	288,000	6,557,710	4%	582,000	20,419,931	3%	2%
1994	274,000	6,932,329	4%	856,000	27,352,260	3%	3%
1995	131,000	5,138,387	3%	987,000	32,490,647	3%	4%
1996	70,000	4,469,764	2%	1,057,000	36,960,411	3%	4%
1997	125,000	4,940,193	3%	1,182,000	41,900,604	3%	4%
1998	145,000	4,303,847	3%	1,327,000	46,204,451	3%	5%
1999	232,000	5,067,234	5%	1,559,000	51,271,685	3%	6%
2000	216,000	4,886,807	4%	1,775,000	56,158,492	3%	6%
2001	179,000	4,079,671	4%	1,954,000	60,238,163	3%	7%
2002	242,000	4,955,064	5%	2,196,000	65,193,227	3%	8%
2003	380,000	4,785,311	8%	2,576,000	69,978,538	4%	9%
2004	314,000	4,516,660	7%	2,890,000	74,495,198	4%	10%
2005	311,000	4,753,393	7%	3,201,000	79,248,591	4%	11%
2006	398,000	5,531,699	7%	3,599,000	84,780,290	4%	13%
2007	498,000	6,081,149	8%	4,097,000	90,861,439	5%	15%
2008	633,000	6,151,414	10%	4,730,000	97,012,853	5%	17%
2009	1,006,000	8,376,936	12%	5,736,000	105,389,789	5%	20%
2010	584,000	7,386,527	8%	6,320,000	112,776,316	6%	22%
2011	816,000	8,415,769	10%	7,136,000	121,192,085	6%	25%
2012	1,630,000	11,655,709	14%	8,766,000	132,847,794	7%	31%
2013	2,275,000	14,767,938	15%	11,041,000	147,615,732	7%	39%
2014	1,187,000	11,342,899	10%	12,228,000	158,958,631	8%	43%
2015	1,605,000	12,060,780	13%	13,833,000	171,019,411	8%	49%
2016	2,447,000	15,048,092	16%	16,280,000	186,067,503	9%	58%
2017	1,564,000	11,542,343	14%	17,844,000	197,609,846	9%	63%
2018	1,956,000	11,377,191	17%	19,800,000	208,987,037	9%	70%
2019	1,848,000	9,478,521	19%	21,648,000	218,465,558	10%	77%
2020	2,798,000	15,250,004	18%	24,446,000	233,715,562	10%	87%
2021	3,698,000	21,037,810	18%	28,144,000	254,753,372	11%	100%

Source: Source: NSSF, *Firearm Production in the United States with Firearm Import and Export Data, 2023 Edition* (2024), at 7, 16.



25. A similar pattern appears when examining the total number of MSRs compared to the total number of all firearms that annually enter the domestic stock (Figure 4) as well as the entry of MSRs as a percentage of all firearms entering the domestic stock in a given year (Figure 5). The same holds when examining the cumulative number of MSRs in the domestic stock compared to the cumulative number of all firearms that entered the domestic stock on an annual basis (Figure 6) as well as the cumulative entry of MSRs as a percentage of all firearms that had cumulatively entered the domestic stock on an annual basis (Figure 7). If NSSF estimates are accurate, then MSRs only account for 11% of the domestic stock of firearms in the United States, as of the end of 2021 (Figure 8).<sup>29</sup> All of the data pertaining to MSRs published by the NSSF point to the same conclusion: production and importation of MSRs is a very recent phenomenon.

**Figure 3. NSSF Estimate of Cumulative Number of MSRs in Any Given Year as a Share of All Cumulative MSRs, 1990-2021**

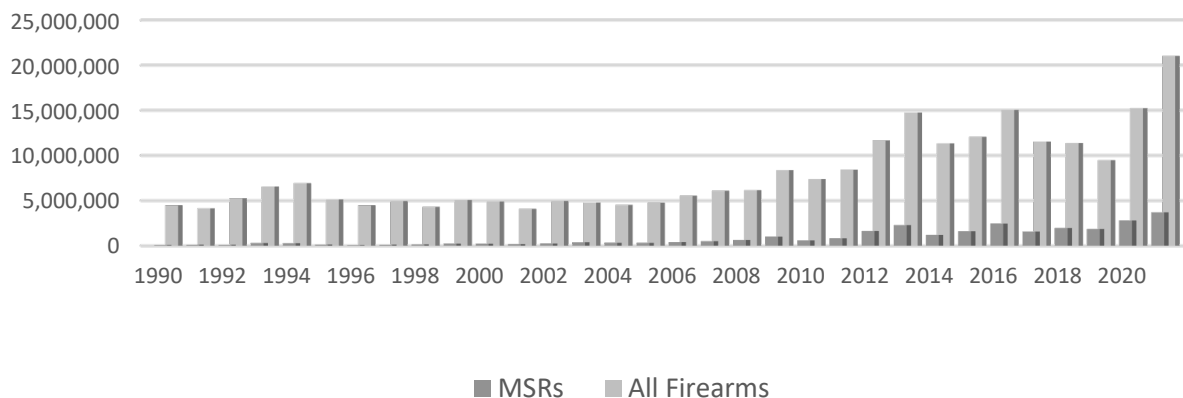


Source: Source: NSSF, *Firearm Production in the United States with Firearm Import and Export Data*, 2023 Edition (2024), at 7.

<sup>29</sup> The 11% figure is clearly an over-estimate because the NSSF measures the domestic stock beginning in 1990. But with estimates of over 200 million firearms that entered the domestic stock between 1899 and 1990, coupled with the fact that MSRs would only have accounted for a tiny fraction of the pre-1990 domestic stock of firearms (see General Staff, *supra* note 27), the true share of MSRs relative to the entire domestic stock, going back in time by 125 years, is necessarily less than 11%. For more on the estimated domestic stock between 1899 and 1990, see Marianne W. Zawitz, *Guns Used in Crime*, Bureau of Justice Statistics Selected Findings, July 1995, at 2, available at <https://bjs.ojp.gov/content/pub/pdf/GUIC.PDF>.

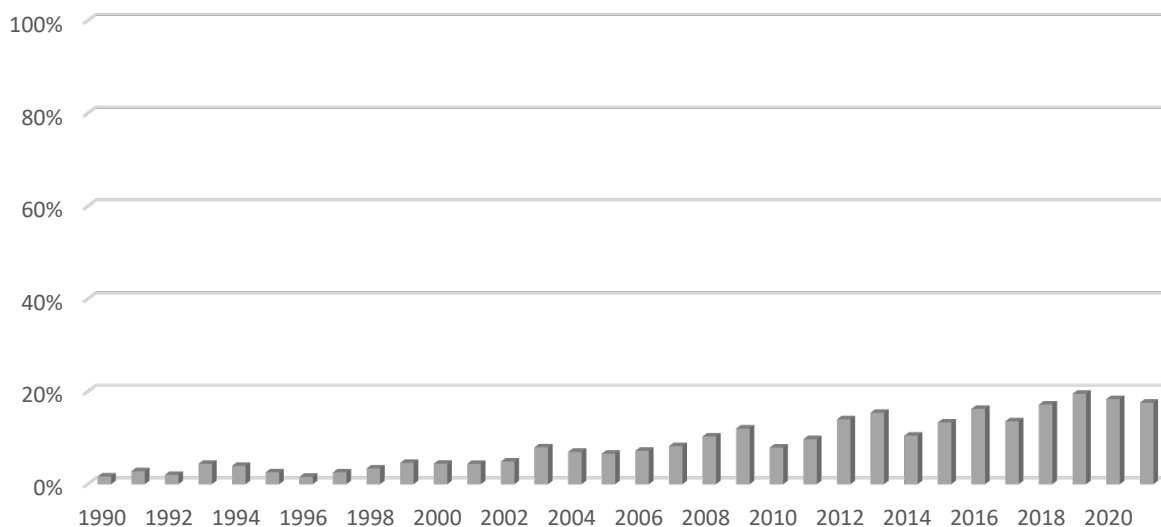


**Figure 4. NSSF Estimate of Annual Number of MSRs Entering the Domestic Stock Compared to Annual Number of All Firearms Entering the Domestic Stock, 1990-2021**



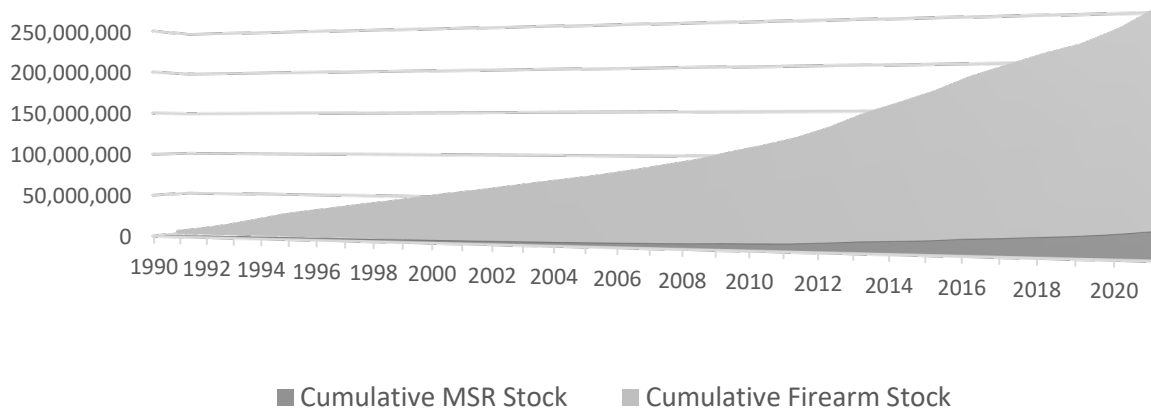
Source: Source: NSSF, *Firearm Production in the United States with Firearm Import and Export Data*, 2023 Edition (2024), at 7, 16.

**Figure 5. Annual Percentage of NSSF Estimate of MSRs Entering the Domestic Stock as a Share of All Firearms Entering the Domestic Year, 1990-2021**



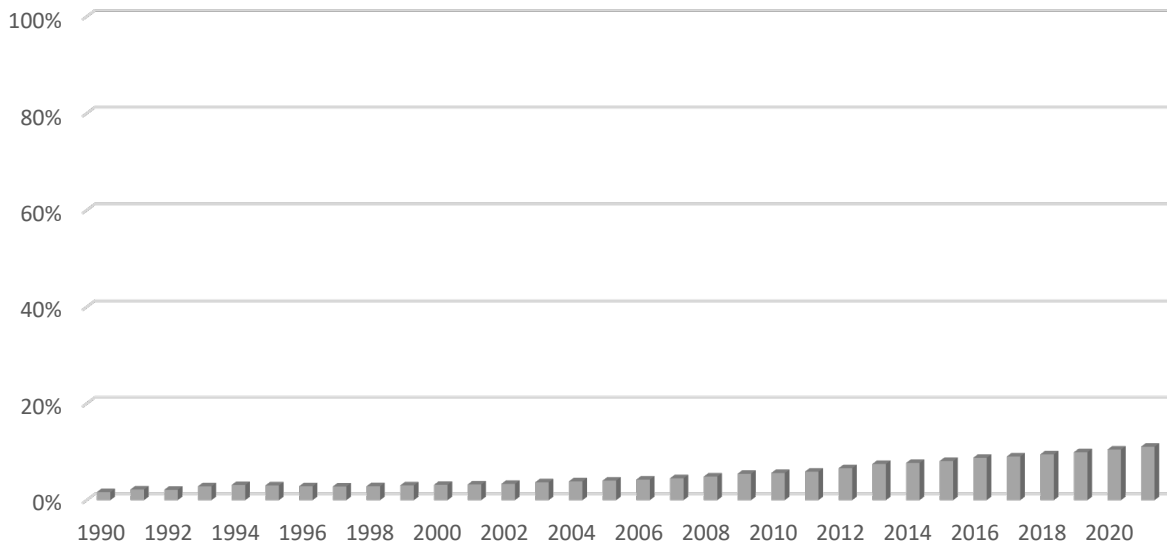
Source: Source: NSSF, *Firearm Production in the United States with Firearm Import and Export Data*, 2023 Edition (2024), at 7, 16.

**Figure 6. NSSF Estimate of Cumulative Number of MSRs in the Domestic Stock Compared to Cumulative Number of All Firearms in the Domestic Stock, 1990-2021**



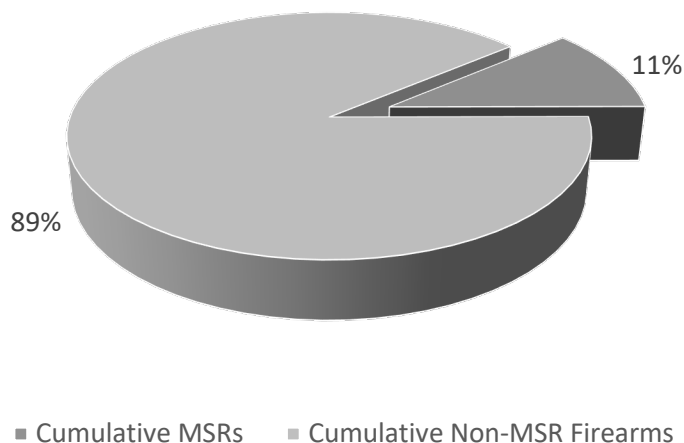
Source: Source: NSSF, *Firearm Production in the United States with Firearm Import and Export Data, 2023 Edition* (2024), at 7, 16.

**Figure 7. Annual Percentage of NSSF Estimate of Cumulative MSRs in the Domestic Stock as a Share of All Firearms in the Domestic Year, 1990-2021**



Source: Source: NSSF, *Firearm Production in the United States with Firearm Import and Export Data, 2023 Edition* (2024), at 7, 16.

**Figure 8. NSSF Estimate of Cumulative Number of MSRs as a Share of Cumulative Number of All Firearms in Domestic Stock, 1990-2021**



Source: Source: NSSF, *Firearm Production in the United States with Firearm Import and Export Data, 2023 Edition* (2024), at 7, 16.

26. The NSSF has also conducted three surveys of MSR owners, with the most recent one conducted between December 2021 and January 2022.<sup>30</sup> By the survey organization's own disclaimer, this survey also appears to be unreliable: "Sports Marketing Surveys cannot guarantee the accuracy of the information contained and does not accept any liability for any loss or damage caused as a result of using information or recommendations contained within this document."<sup>31</sup> Keeping this in mind, one of the most interesting findings is that the average number of MSRs owned has increased from 2.6 per person in 2010, to 3.1 per person in 2013, to 3.8 per person in 2022. Only 24% of respondents in 2022 indicated that they owned only 1 MSR.<sup>32</sup> Akin to the pattern detected in the English survey data, this pattern suggests that ownership of MSRs is likely concentrated. It should be noted, however, that this survey does not appear to meet scientific

<sup>30</sup> NSSF, *Modern Sporting Rifle Comprehensive Consumer Report: Ownership, Usage, and Attitudes Toward AR- and AK-Platform Modern Sporting Rifles* (2022), at 10, available at <https://www3.nssf.org/share/PDF/pubs/NSSF-MSR-Comprehensive-Consumer-Report.pdf>.

<sup>31</sup> *Id.*, at 2.

<sup>32</sup> *Id.*, at 12.

standards. For example, 96% of respondents were males, which means either that other surveys of MSR owners are erroneous or the NSSF survey is way off the mark in terms of survey sample.<sup>33</sup>

27. However, given the lack of transparency regarding its estimates and the inability to reproduce and replicate its statistical claims, NSSF trade data cannot be deemed reliable.

### ***IIIC. The Washington Post / Ipsos Survey***

28. In the Fall of 2022, the *Washington Post* in partnership with Ipsos conducted a survey of adult gun owners. It found that 20% of respondents indicated that they own “AR-15-style rifles, including any semi-automatic weapon built on a common AR-15 platform.” Applying this percentage to a finding from a previous *Washington Post* / Ipsos poll that suggested that there might be 80.8 million gun owners in the United States, the *Washington Post* and Ipsos concluded that “about 16 million Americans own an AR-15.”<sup>34</sup>

29. Among other results from this poll, the *Washington Post* and Ipsos found that 95% of AR-15-platform firearm owners also own handguns, 79% own other long guns (hunting rifles and shotguns), and 33% own antique firearms. In comparison, the breakdown of ownership rates for non-AR-15-platform firearms for all survey respondents was as follows: 80% owned handguns, 62% owned other long guns (hunting rifles and shotguns), and 16% owned antique firearms. The survey results suggest that owners of AR-15-platform firearms are more likely, as a group, to own more firearms of other categories than gun owners who do not own AR-15-platform firearms.<sup>35</sup>

30. While in general the *Washington Post* and Ipsos are considered to be organizations that conduct credible public opinion polls, there are two limitations with this particular survey that warrant providing additional context to the results. One caveat is that, as responses are often sensitive to question wording, the fact that the survey queried ownership of “any semi-automatic weapon built on a common AR-15 platform,” it likely captured respondents who own AR-15-platform handguns as well as those who own AR-15-platform rifles.<sup>36</sup> The other caveat is that the

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<sup>33</sup> *Id.*, at 75.

<sup>34</sup> Emily Guskin, Aadit Tambe, and Jon Gerberg, “What Do Americans Own an AR-15?” *Washington Post*, March 27, 2024, available at <https://www.washingtonpost.com/nation/interactive/2023/american-ar-15-gun-owners>.

<sup>35</sup> *Id.*

<sup>36</sup> I am unaware of how many AR-15-platform firearms are handguns as opposed to rifles.

poll only surveyed a small sample of AR-15-platform firearm owners (399 respondents in total). This resulted in a margin of sampling error of plus-or-minus 5.5%. As to the broader panel of 2,104 gun owners, the margin of sampling error was plus-or-minus 2.5%. Given a 20% ownership result, this creates a range that runs from 17.5% to 22.5%.<sup>37</sup> To put ownership statistics in absolute numbers, if the *Washington Post* / Ipsos survey is accurate, the number of Americans who own AR-15-platform firearms can be as low as 14.1 million adults and as high as 18.2 million adults.<sup>38</sup>

### ***IIID. Inconsistencies Across the Different Sources on AR-15-Style Firearm Circulation and Ownership***

31. When comparing the English survey, the NSSF publications, and the *Washington Post*/Ipsos survey, a key takeaway stands out: the results from each source appear to contradict the other sources. This means one of two things: (1) one of these three sources is likely correct and the other two are likely incorrect or (2) all three sources are likely incorrect. Table 2 provides a breakdown of the key estimates from each source.

**Table 2. Comparison of English, NSSF, and *Washington Post* / Ipsos Estimates**

<b>Source</b>	<b>Estimated Percentage of MSR/AR-15-Style Rifle Owners</b>	<b>Estimated Number of MSRs/AR-15-Style Rifles</b>	<b>Mean Average Number of MSRs/AR-15-Style Rifles Personally-Owned</b>	<b>Estimated Number of Americans That Personally Own MSRs/AR-15-Style Rifles</b>
English Survey	30.2	44 million	1.8	24.6 million
NSSF	6.1	28.1 million	3.8	7.4 million
<i>WP</i> / Ipsos Survey	20	16+ million	1.0+	16 million

32. To put these competing estimates in perspective, the percentage of AR-15-style rifle owners reflected in the English survey marks a 50% increase from the percentage of AR-15-style rifle owners reflected in the *Washington Post* / Ipsos survey, and a 395% increase in

<sup>37</sup> Guskin, Tambe, and Gerberg, *supra* note 35.

<sup>38</sup> Using this declaration's working mean average of 77.1 million gun owners produces a range of 13.5 to 17.3 million AR-15-platform firearm owners.

comparison to NSSF MSR figures. Moreover, the NSSF suggests that the number of MSRs that are personally owned could be as low as 7.4 million. In contrast, Professor English found that the number of AR-15-style rifles that have been owned by Americans could be as high as 44 million—a roughly six-fold increase.<sup>39</sup>

33. Similarly, comparing the English and NSSF estimates produces substantial differences. For instance, Professor English’s 44 million figure is 57% higher than the 28.1 million MSRs that the NSSF estimates entered into the domestic firearms market between 1990 and 2021—and the NSSF estimate reflects the entire domestic stock, not the necessarily smaller subset of MSRs personally owned by private civilians. Professor English also claims to have found that owners of AR-15-style rifles have owned a mean average of 1.8 such rifles. In its survey of MSR owners, the NSSF claims to have found that the mean average number of MSRs owned was 3.8 such rifles per person. This is a drastically different number than the 1.8 average reported by Professor English. Using the data collected in the English and NSSF surveys generates a range of total MSR/AR-15-style rifle owners that runs from 7.4 million people to 24.6 million people—which reflects more than a three-fold difference.

34. The bottom line is that the various sources pertaining to circulation and ownership of AR-15-style rifles offer competing estimates that are significantly different. Furthermore, and perhaps most important of all, none of these statistics—which only address rifles that may or may not qualify as assault weapons—indicate how many assault weapons are actually in circulation and personally owned by adults in the United States.

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<sup>39</sup> The NSSF does not actually offer an estimate of MSR owners. However, for heuristic purposes, the maximum number of possible MSR owners, according to NSSF figures, is 7.4 million people. This is calculated by taking the total number of MSRs claimed to be in circulation (28.1 million) and, assuming those MSRs as all personally owned by private civilians (which of course they are not), dividing the 28.1 million figure by the mean average number of MSRs owned (3.8), to generate a maximum number of MSR owners (7.4 million). The NSSF estimated percentage of gun owners who own an MSR is calculated by taking the number of estimated MSR owners (7.4 million) and dividing it by the number of gun owners the NSSF estimates that there are currently in the U.S. (121.2 million). This comes out as 0.061, or 6.1%. The estimate of 121.2 million gun owners is based on the NSSF claim that 36.3% of the U.S. population (currently 334 million people) owns firearms. See NSSF, *Detachable Magazine Report, 1990-2021*, (2024), at 4, available at <https://nssfresearch.s3.amazonaws.com/Detachable-Magazine-NSSFReport.pdf>.

### ***IIIE. Summary***

35. As shown above, most sources that have attempted to gauge circulation and ownership of modern sporting rifles are methodologically flawed and, therefore, unreliable. The bottom line is that the number of assault weapons in circulation or that are personally owned by American gun owners is unknown. As such, the circulation and ownership rates for assault weapons are indeterminable. One aspect of firearm circulation and ownership that is known with reasonable certainty is that handguns are the most common type of firearm in circulation and personally owned—not rifles, and most certainly not rifles that qualify as assault weapons..

## **IV. USE OF ASSAULT WEAPONS**

36. Firearms are instruments of violence that are used to perpetrate violent crime (offensive gun uses) as well as to protect people or property (defensive gun uses). The following section draws on available evidence to discuss how assault weapons are used in the United States for offensive and defensive purposes.

### ***IVA. Offensive Gun Uses***

37. Data on the use of assault weapons to commit violent crimes other than mass shootings are sparse. Indeed, the only recent source to have examined this relationship appears to be a 2018 peer-reviewed analysis of “crime guns”—guns involved in a crime that have been recovered and traced—tied to violent crimes in 10 cities across the United States plus those traced nationwide by the ATF, at various times between 2011 and 2014.<sup>40</sup> The percentage of crime guns across the 10 metropolitan areas that were assault weapons ranged from a low of 2.4% in Baltimore, Maryland, to a high of 8.5% in Syracuse, New York. The mean average of assault weapon averages for crime guns recovered across the 10 cities was 4.3%.<sup>41</sup> Similarly,

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<sup>40</sup> Christopher S. Koper et al., “Criminal Use of Assault Weapons and High-Capacity Semiautomatic Firearms: An Updated Examination of Local and National Sources,” 95 *Journal of Urban Health* 313 (2018). The 10 cities covered in the study were Baltimore, MD, Hartford, CT, Kansas City, MO, Milwaukee, WI, Minneapolis, MN, Richmond, VA, Rochester, NY, Sacramento, CA, Seattle, WA, and Syracuse, NY.

<sup>41</sup> *Id.*, at 317.

approximately 5% of the nearly 500,000 crime guns traced nationwide by the ATF between 2013 and 2014 were assault weapons.<sup>42</sup>

38. In addition, the study examined the firearm categories (handguns, rifles, or shotguns) of the recovered assault weapons in the 10 cities: “Assault rifles (e.g., variations of the AR-15 or AK-47) accounted for the majority of AWs [assault weapons] in all sites and more than three-quarters in all but one (Richmond). The remaining AWs [assault weapons] consisted entirely (or nearly so) of assault pistols (e.g., the TEC-9 or TEC-22).”<sup>43</sup>

39. The study also reviewed FBI data on the firearms used in the murder of law enforcement officials between 2009 and 2013. After excluding instances where a police officer’s own firearm was used to kill the officer, the study found that assault weapons accounted for 13.2% of the firearms that were used to shoot and kill police officers. Of these assault weapons that were used to murder law enforcement officers, 97% were assault rifles.<sup>44</sup>

40. Unlike data on the relationship between assault weapons and violent crime in general, there is ample data on the relationship between assault weapons and mass shootings. A review of this data points to four key takeaways: (1) mass shootings resulting in double-digit fatalities are relatively modern phenomena in American history, often related to the use of assault weapons; (2) mass shootings pose a significant—and growing—threat to American public safety; (3) mass shootings involving assault weapons, on average, have resulted in a substantially larger loss of life than similar incidents that did not involve assault weapons; and (4) jurisdictions that restrict assault weapons experience fewer mass shooting incidents and fatalities, per capita, than jurisdictions that do not restrict assault weapons.<sup>45</sup>

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<sup>42</sup> *Id.*, at 318.

<sup>43</sup> *Id.*, at 316.

<sup>44</sup> *Id.*, at 317.

<sup>45</sup> For purposes of this declaration, I employ two prominent definitions of mass shootings from the field of firearm violence research. “High-fatality mass shootings” (also referred to as “gun massacres”) are shootings resulting in six or more fatalities, not including the perpetrator(s), regardless of location or underlying motive. “Mass public shootings” are shootings resulting in four or more fatalities, not including the perpetrator(s), occurring largely in a public setting and not undertaken in pursuit of an underlying criminal objective (e.g., robbery, illicit trafficking, organized crime, gang violence, or domestic violence). Unfortunately, long-term, publicly-available, exhaustive data on all mass shootings resulting in four or more fatalities, not including the perpetrator(s), regardless of location or underlying motive, are presently not available. This limits comprehensive scholarly analyses over a long period of time to the above two types of mass shooting violence: high-fatality mass shootings and mass public shootings. The



**IVAi. Double-Digit Fatality Mass Shootings in American History Are Post-World War II Phenomena and They Often Involve Assault Weapons.**

41. An lengthy search and examination of the historical occurrence and distribution of mass shootings resulting in ten or more victims killed since 1776 (Table 3) shows that, in terms of the origins of this form of extreme gun violence, there is no known occurrence of a mass shooting resulting in double-digit fatalities during the 173-year period between the nation's founding in 1776 and 1948.<sup>46</sup> The first known mass shooting resulting in ten or more deaths occurred in 1949. In other words, for 70% of its 248-year existence as a nation, the United States did not experience a mass shooting resulting in double-digit fatalities, making them relatively modern phenomena in American history.

42. After the first such incident in 1949, 17 years passed until a similar mass shooting occurred in 1966. The third such mass shooting then occurred nine years later, in 1975. And the fourth such incident occurred seven years after, in 1982. Basically, the first few mass shootings resulting in ten or more deaths did not occur until the post-World War II era. Furthermore, these first few double-digit fatality incidents occurred with relative infrequency, although the temporal gap between these first four incidents shrank with each event (Table 3).

43. The distribution of double-digit fatality mass shootings changes in the early 1980s, when five such events took place in a span of just five years (Table 3). This timeframe reflects the first time that assault weapons were used to perpetrate mass shootings resulting in ten or more deaths: the 1982 Wilkes-Barre, PA, massacre (involving an AR-15 rifle and resulting in 13 deaths)

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data on high-fatality mass shootings is from a data set that I maintain and continuously update. This data set is reproduced in **Exhibit B**. The data set of mass public shootings that I analyzed is publicly available from The Violence Project. The creation of this data set was funded by the National Institute of Justice, which is part of the U.S. Department of Justice. In addition to basic variables, such as incident dates and locations, casualty counts, and information on offenders, The Violence Project data set also identifies whether an assault weapon was used in a mass public shooting. The Violence Project data set (version 8.0) is available at <https://www.theviolenceproject.org/mass-shooter-database>. The Violence Project data set is reproduced in **Exhibit C**. Unless stated otherwise, all of the data used to perform original analyses and to construct tables and figures in Section IV of this declaration, as well as coding definitions, are drawn from **Exhibits B and C**.

<sup>46</sup> I searched for firearm-related "murders," using variations of the term, setting a minimum fatality threshold of ten in the Newspaper Archive online newspaper repository, available at [www.newspaperarchive.com](http://www.newspaperarchive.com). The Newspaper Archive contains local and major metropolitan newspapers dating back to 1607. Consistent with other analyses on mass murder, incidents of large-scale, inter-group violence such as mob violence, rioting, combat or battle skirmishes, and attacks initiated by authorities acting in their official capacity were excluded.

and the 1984 San Ysidro, CA, massacre (involving an Uzi pistol and resulting in 21 deaths). But this cluster of incidents was followed by a 20-year period in which only two double-digit-fatality mass shootings occurred (Table 3). This period of time from 1987-2007 correlates with three important federal firearms measures: the 1986 Firearm Owners Protection Act, the 1989 Code of Federal Regulations “sporting use” importation restrictions, and the 1994 Federal Assault Weapons Ban.

44. It is well-documented in the academic literature that, after the Federal Assault Weapons Ban expired in 2004, mass shooting violence increased substantially.<sup>47</sup> Mass shootings that resulted in ten or more deaths were no exception, following the same pattern. In the 56 years from 1949 through 2004, there were a total of ten mass shootings resulting in double-digit fatalities (a frequency rate of one incident every 5.6 years). In the 19 years since 2004, there have been 22 double-digit fatality mass shootings (a frequency rate of one incident every 0.9 years). In other words, the frequency rate has increased over six-fold since the Federal Assault Weapons Ban expired (Table 3). (The 1994 Federal Assault Weapons Ban and its impact on mass shooting violence is discussed in further detail below.)

45. Nearly 8-in-10 (78%) of the mass shootings resulting in ten or more deaths involved assault weapons and/or LCMs.

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<sup>47</sup> See, for example, Klarevas, *supra* note 1; Klarevas et al., *supra* note 2; Charles DiMaggio et al., “Changes in US Mass Shooting Deaths Associated with the 1994-2004 Federal Assault Weapons Ban: Analysis of Open-Source Data,” 86 *Journal of Trauma and Acute Care Surgery* 11 (2019); Lori Post et al., “Impact of Firearm Surveillance on Gun Control Policy: Regression Discontinuity Analysis,” 7 *JMIR Public Health and Surveillance* (2021); Philip J. Cook and John J. Donohue, “Regulating Assault Weapons and Large-Capacity Magazines for Ammunition,” 328 *JAMA*, September 27, 2022; and John J. Donohue, “The Effect of Permissive Gun Laws on Crime,” 704 *ANNALS of the American Academy of Political and Social Science* 92 (2022).

**Table 3. Mass Shootings Resulting in Double-Digit Fatalities in U.S. History, 1776-2023**

	<b>Date</b>	<b>Location</b>	<b>Deaths</b>	<b>Involved Assault Weapon(s)</b>	<b>Involved LCM(s)</b>
1	9/6/1949	Camden, NJ	13	N	N
2	8/1/1966	Austin, TX	14	N	Y
3	3/30/1975	Hamilton, OH	11	N	N
4	9/25/1982	Wilkes-Barre, PA	13	Y	Y
5	2/18/1983	Seattle, WA	13	N	N
6	4/15/1984	Brooklyn, NY	10	N	N
7	7/18/1984	San Ysidro, CA	21	Y	Y
8	8/20/1986	Edmond, OK	14	N	N
9	10/16/1991	Killeen, TX	23	N	Y
10	4/20/1999	Littleton, CO	13	Y	Y
11	4/16/2007	Blacksburg, VA	32	N	Y
12	3/10/2009	Geneva County, AL	10	Y	Y
13	4/3/2009	Binghamton, NY	13	N	Y
14	11/5/2009	Fort Hood, TX	13	N	Y
15	7/20/2012	Aurora, CO	12	Y	Y
16	12/14/2012	Newtown, CT	27	Y	Y
17	9/16/2013	Washington, DC	12	N	N
18	12/2/2015	San Bernardino, CA	14	Y	Y
19	6/12/2016	Orlando, FL	49	Y	Y
20	10/1/2017	Las Vegas, NV	60	Y	Y
21	11/5/2017	Sutherland Springs, TX	25	Y	Y
22	2/14/2018	Parkland, FL	17	Y	Y
23	5/18/2018	Santa Fe, TX	10	N	N
24	10/27/2018	Pittsburgh, PA	11	Y	Y
25	11/7/2018	Thousand Oaks, CA	12	N	Y
26	5/31/2019	Virginia Beach, VA	12	N	Y
27	8/3/2019	El Paso, TX	23	Y	Y
28	3/22/2021	Boulder, CO	10	Y	Y
29	5/14/2022	Buffalo, NY	10	Y	Y
30	5/24/2022	Uvalde, TX	21	Y	Y
31	1/21/2023	Monterey Park, CA	11	Y	Y
32	10/25/2023	Lewiston, ME	18	Y	Y

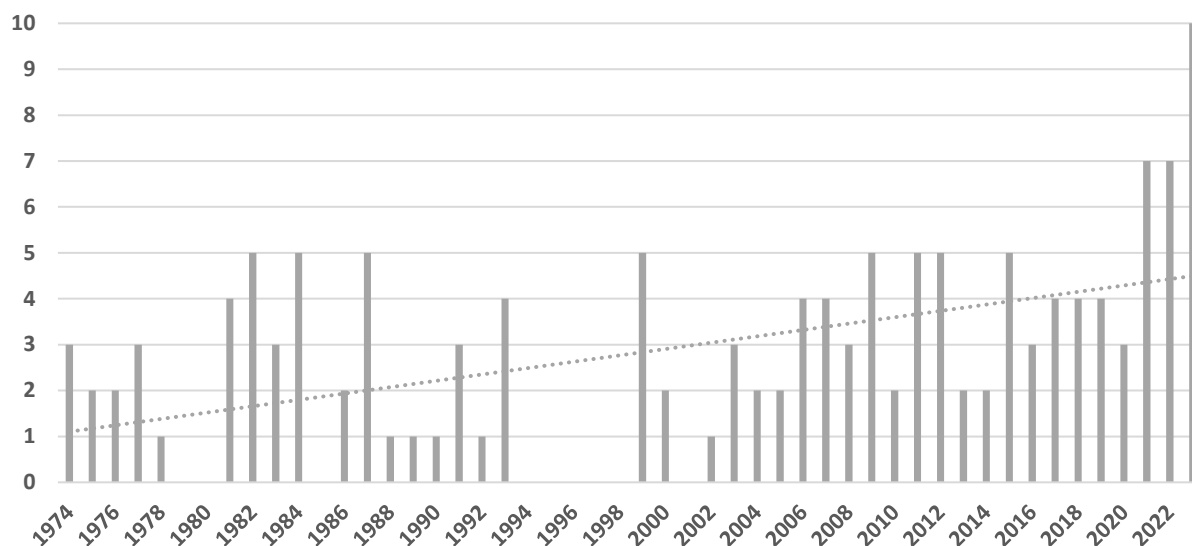
Note: Death tolls do not include perpetrators. An incident was coded as involving an assault weapon if at least one of the firearms discharged was defined as an assault weapon in (1) the 1994 federal Assault Weapons Ban; (2) the statutes of the state where the gun massacre occurred; or (3) a legal or judicial declaration issued by a state official. An incident was coded as involving an LCM if at least one of the firearms discharged was armed with a detachable ammunition-feeding device holding more than ten rounds.

**IV Aii. Mass Shootings Are a Growing Threat to Public Safety.**

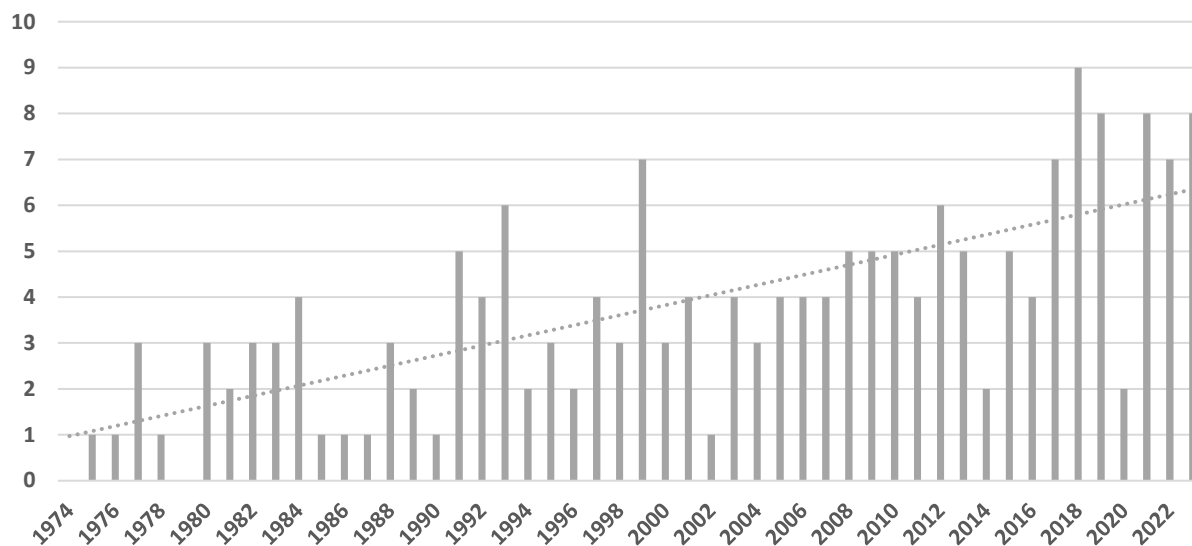
46. Examining mass-casualty acts of violence in the United States points to two disturbing patterns. First, as demonstrated in Table 4, the ten deadliest individual acts of intentional criminal violence in the United States since the terrorist attack of September 11, 2001, have all been mass shootings. Second, as displayed in Figures 9-12, the problem of mass shooting violence is on the rise in terms of both incidents and fatalities. To put the increase over the last 50 years into perspective, between the ten-year-period of 1974-1983 and the ten-year-period of 2014-2023, the average population of the United States increased approximately 46%. However, the number of people killed in high-fatality mass shootings and mass public shootings between these two ten-year-periods, respectively, reflect 230% and 502% increases. In other words, the rise in mass shooting violence has far outpaced the rise in national population. A key takeaway from these patterns and trends is that mass shootings pose a significant—and growing—threat to American public safety.

**Table 4. The Ten Deadliest Acts of Intentional Criminal Violence in the U.S. since 9/11**

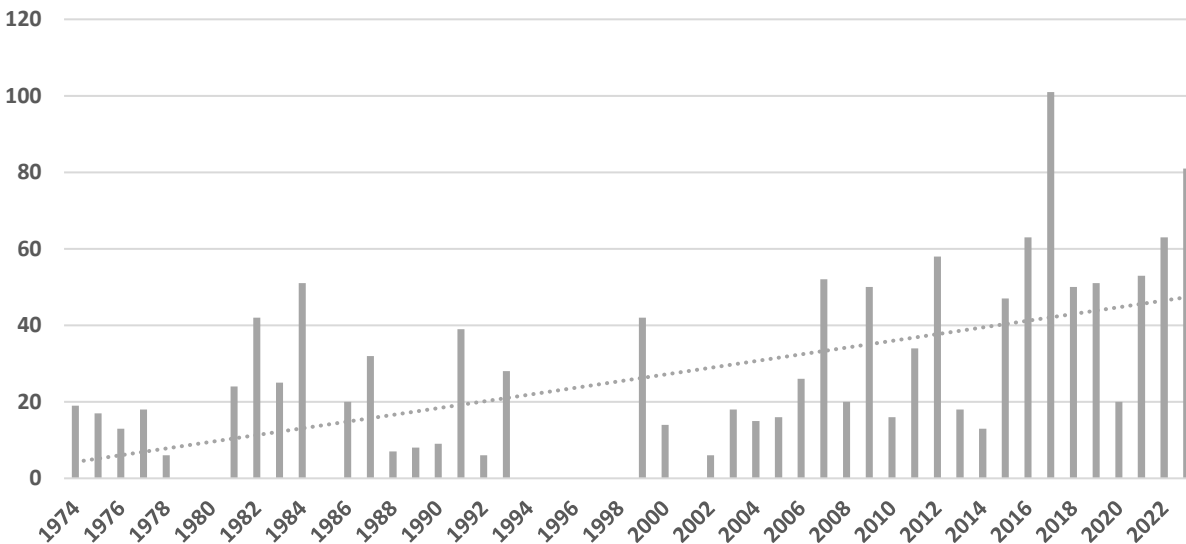
	<b>Deaths</b>	<b>Date</b>	<b>Location</b>	<b>Type of Violence</b>
1	60	October 1, 2017	Las Vegas, NV	Mass Shooting
2	49	June 12, 2016	Orlando, FL	Mass Shooting
3	32	April 16, 2007	Blacksburg, VA	Mass Shooting
4	27	December 14, 2012	Newtown, CT	Mass Shooting
5	25	November 5, 2017	Sutherland Springs, TX	Mass Shooting
6	23	August 3, 2019	El Paso, TX	Mass Shooting
7	21	May 24, 2022	Uvalde, TX	Mass Shooting
8	18	October 25, 2023	Lewiston, ME	Mass Shooting
9	17	February 14, 2018	Parkland, FL	Mass Shooting
10	14	December 2, 2015	San Bernardino, CA	Mass Shooting

**Figure 9. Annual Trends in High-Fatality Mass Shooting Incidents, 1974-2023**

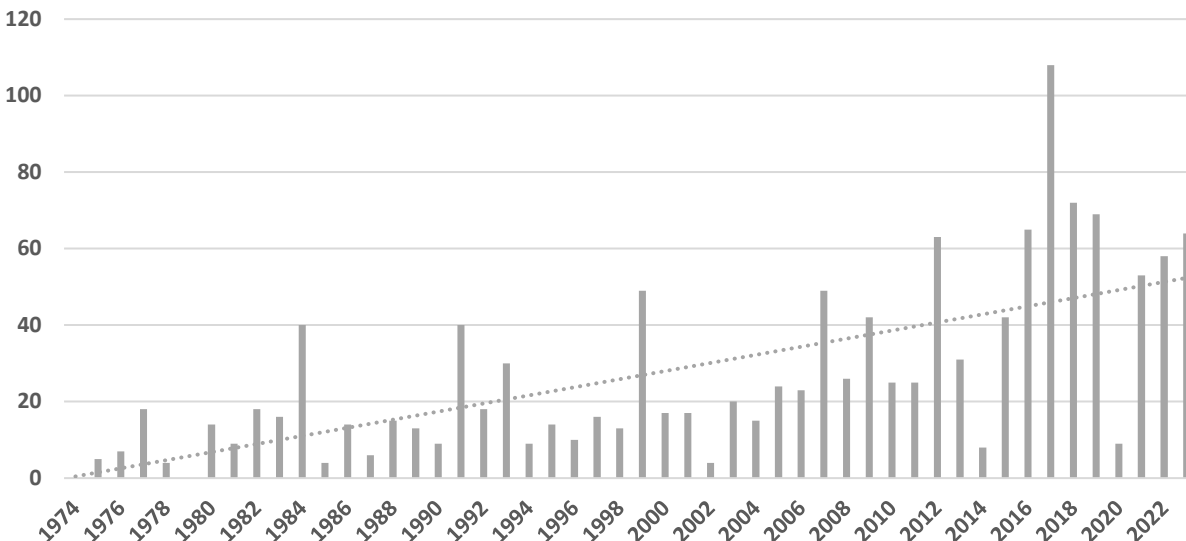
Note: The dotted line is a linear trendline. A linear trendline is a straight line that captures the overall pattern of the individual data points. When there is a positive relationship between the x-axis and y-axis variables, the trendline moves upwards from left to right. When there is a negative relationship between the x-axis and y-axis variables, the trendline moves downwards from left to right.

**Figure 10. Annual Trends in Mass Public Shooting Incidents, 1974-2023**

Note: The dotted line is a linear trendline. A linear trendline is a straight line that captures the overall pattern of the individual data points. When there is a positive relationship between the x-axis and y-axis variables, the trendline moves upwards from left to right. When there is a negative relationship between the x-axis and y-axis variables, the trendline moves downwards from left to right.

**Figure 11. Annual Trends in High-Fatality Mass Shooting Deaths, 1974-2023**

Note: The dotted line is a linear trendline. A linear trendline is a straight line that captures the overall pattern of the individual data points. When there is a positive relationship between the x-axis and y-axis variables, the trendline moves upwards from left to right. When there is a negative relationship between the x-axis and y-axis variables, the trendline moves downwards from left to right.

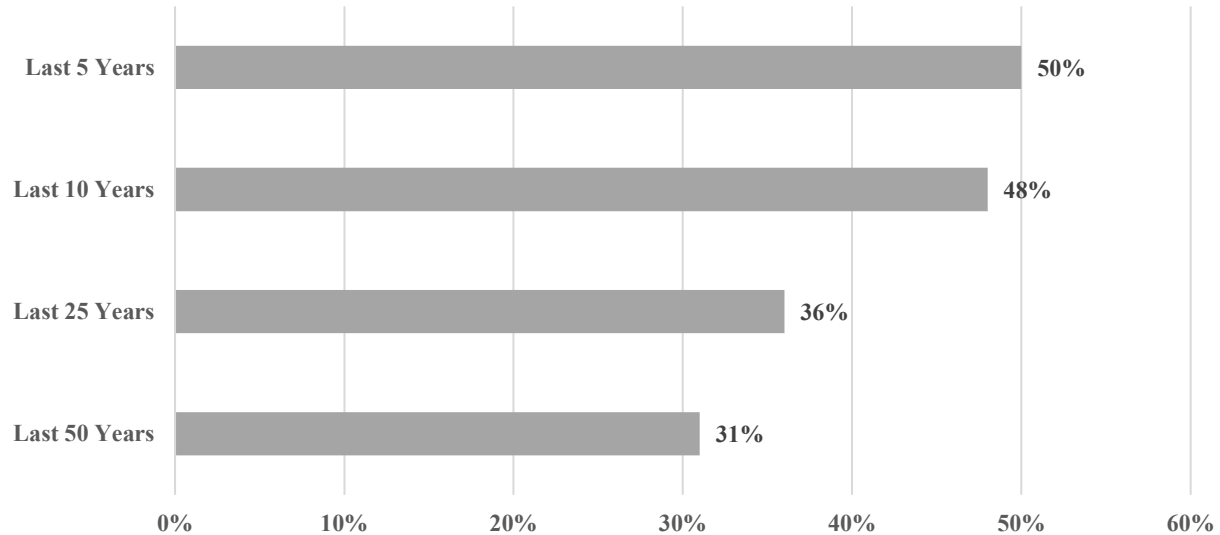
**Figure 12. Annual Trends in Mass Public Shooting Deaths, 1974-2023**

Note: The dotted line is a linear trendline. A linear trendline is a straight line that captures the overall pattern of the individual data points. When there is a positive relationship between the x-axis and y-axis variables, the trendline moves upwards from left to right. When there is a negative relationship between the x-axis and y-axis variables, the trendline moves downwards from left to right.

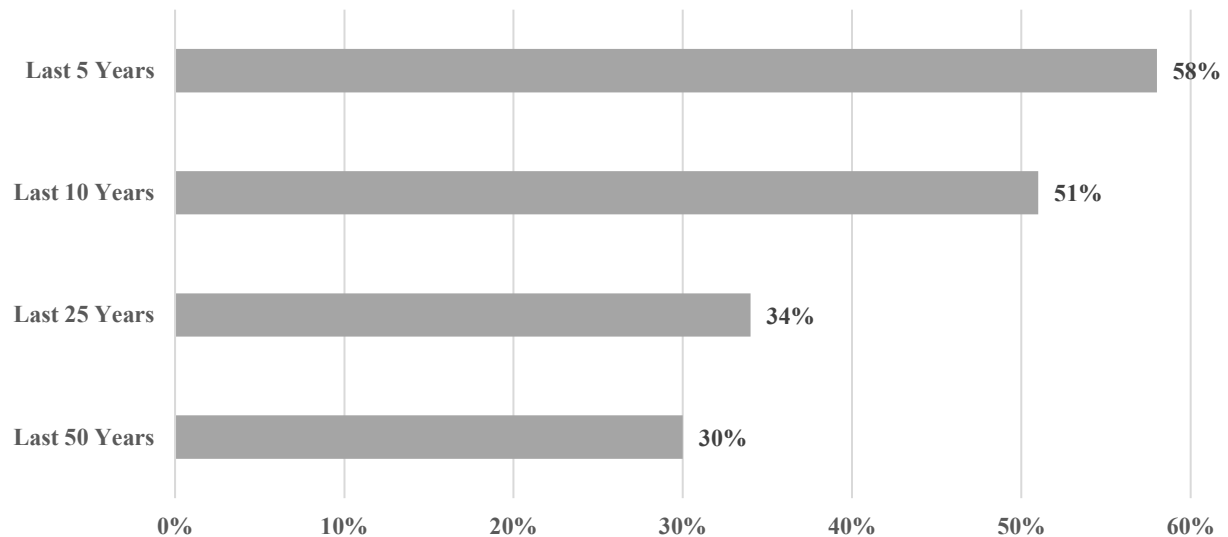
**IV.Aiii. The Use of Assault Weapons Is a Major Factor in the Rise of Mass Shooting Violence.**

47. In addition to showing that the frequency and lethality of mass shootings are on the rise nationally, the data point to another striking pattern: the use of assault weapons in the commission of mass shootings has grown in vast proportions. In both high-fatality mass shootings and mass public shootings, assault weapons have been used with increased frequency. As shown in Figures 13 and 14, the pattern is particularly marked of late, with 50% of high-fatality mass shooting incidents and 58% of mass public shooting incidents in the last five years involving assault weapons. A similar, albeit more pronounced, pattern is found when examining fatalities in the last five years, with 61% of high-fatality mass shooting deaths and 67% of mass public shooting deaths resulting from incidents involving assault weapons, as shown in Figures 15 and 16. These trends clearly demonstrate that, among mass shooters, there is a growing preference for using assault weapons to perpetrate their attacks.

48. The growing use of assault weapons to carry out mass shootings is an obvious pattern reflected in the data. Another pattern that stands out reflects the disproportionately greater lethality associated with the use of assault weapons. Returning to the aforementioned list of the ten deadliest individual acts of intentional criminal violence in the United States since the coordinated terrorist attack of September 11, 2001, besides all ten of the incidents being mass shootings, nine of the ten incidents (90%) involved assault weapons, as shown in Table 5. When mass shooting fatalities are examined on a rising scale, the relationship between assault weapons and higher death tolls is striking. In the past 50 years, assault weapons have been used in approximately 30% of all high-fatality mass shootings and mass public shootings. However, as the fatality threshold increases, so too does the share of incidents involving assault weapons, indicating an association between assault weapons and lethality. For instance, assault weapons were used in 69% of mass public shootings resulting in more than 12 deaths and 80% of such incidents resulting in more than 24 deaths. Moreover, assault weapons were used in 78% of all high-fatality mass shootings resulting in more than 20 deaths and 100% of such incidents resulting in over 40 deaths (Figures 17-18).

**Figure 13. Share of High-Fatality Mass Shootings Involving Assault Weapons**

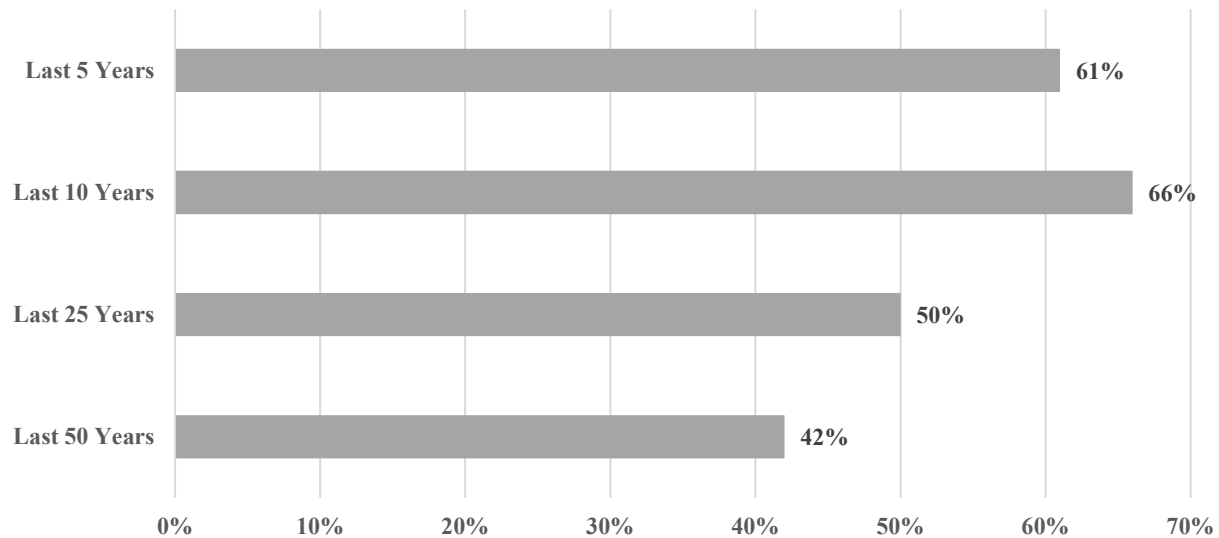
Note: The calculations in Fig. 13 exclude three high-fatality mass shootings (3/15/2020, Moncure, NC, six deaths; 9/7/2020, Aguanga, CA, seven deaths; and 1/16/2023, Goshen, CA, six deaths) in which the firearms used are unknown.

**Figure 14. Share of Mass Public Shootings Involving Assault Weapons**

Note: The calculations in Fig. 14 exclude one mass public shooting (2/6/17, Yazoo City, MS, four deaths) in which the firearms used are unknown.

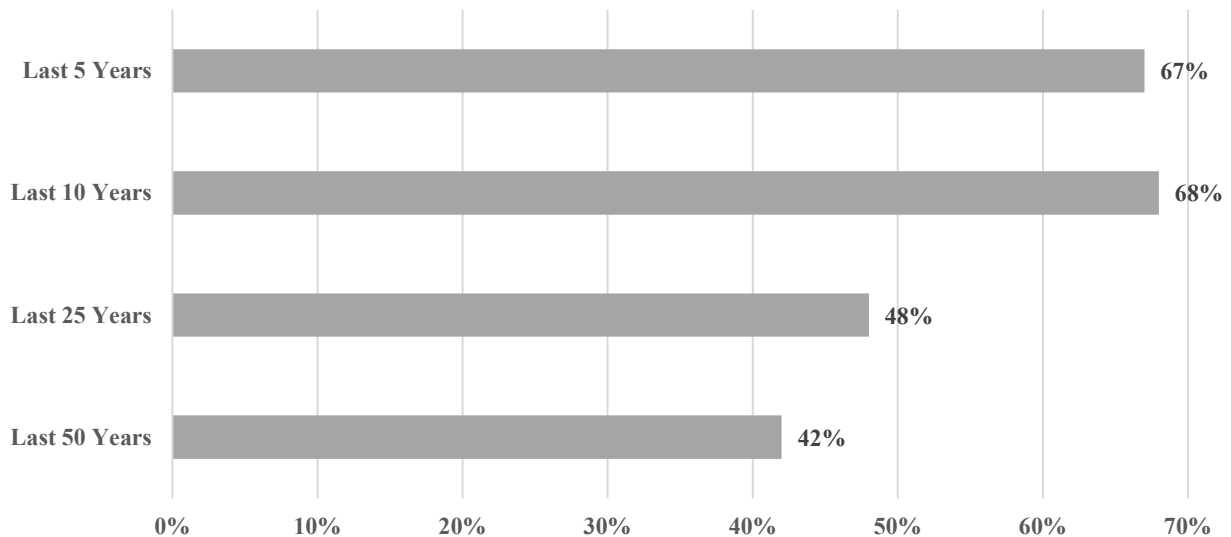


**Figure 15. Share of High-Fatality Mass Shooting Deaths Resulting from Incidents Involving Assault Weapons**



Note: The calculations in Fig. 15 exclude three high-fatality mass shootings (3/15/2020, Moncure, NC, six deaths; 9/7/2020, Aguanga, CA, seven deaths; and 1/16/2023, Goshen, CA, six deaths) in which the firearms used are unknown.

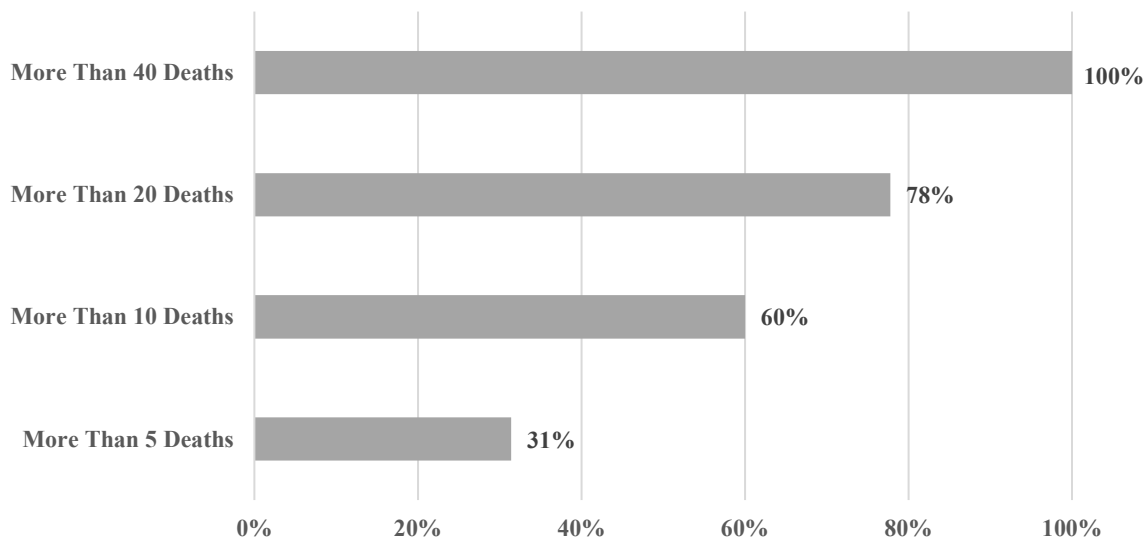
**Figure 16. Share of Mass Public Shooting Deaths Resulting from Incidents Involving Assault Weapons**



Note: The calculations in Fig. 16 exclude one mass public shooting (2/6/17, Yazoo City, MS, four deaths) in which the firearms used are unknown.

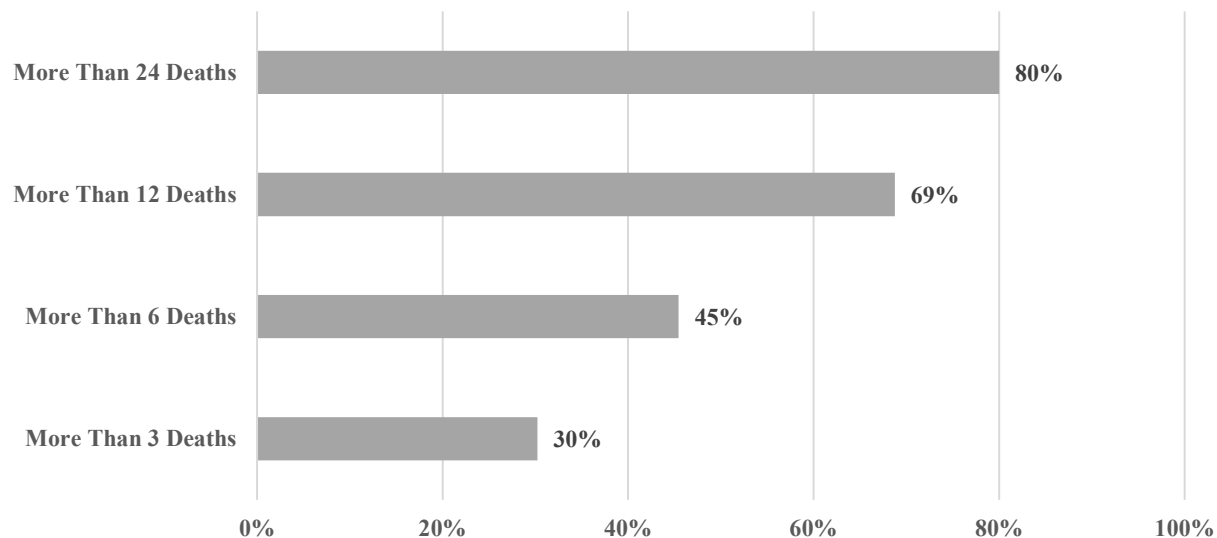
**Table 5. The Use of Assault Weapons in the Ten Deadliest Acts of Intentional Criminal Violence in the U.S. since 9/11**

<b>Deaths</b>	<b>Date</b>	<b>Location</b>	<b>Involved Assault Weapon(s)</b>
60	October 1, 2017	Las Vegas, NV	✓ (AR-15)
49	June 12, 2016	Orlando, FL	✓ (AR-15)
32	April 16, 2007	Blacksburg, VA	--
27	December 14, 2012	Newtown, CT	✓ (AR-15)
25	November 5, 2017	Sutherland Springs, TX	✓ (AR-15)
23	August 3, 2019	El Paso, TX	✓ (AK-47)
21	May 24, 2022	Uvalde, TX	✓ (AR-15)
18	October 25, 2023	Lewiston, ME	✓ (AR-15)
17	February 14, 2018	Parkland, FL	✓ (AR-15)
14	December 2, 2015	San Bernardino, CA	✓ (AR-15)

**Figure 17. Percentage of High-Fatality Mass Shootings Involving Assault Weapons by Fatality Threshold, 1974-2023**

Note: The calculations in Fig. 17 exclude three high-fatality mass shootings (3/15/2020, Moncure, NC, six deaths; 9/7/2020, Aguanga, CA, seven deaths; and 1/16/2023, Goshen, CA, six deaths) in which the firearms used are unknown.

**Figure 18. Percentage of Mass Public Shootings Involving Assault Weapons by Fatality Threshold, 1974-2023**



Note: The calculations in Fig. 18 exclude one mass public shooting (2/6/17, Yazoo City, MS, four deaths) in which the firearms used are unknown.

49. Of the 137 high-fatality mass shootings in the last 50 years in which the type of firearm used is known, 43 involved assault weapons, resulting in 540 deaths. The average death toll for these 43 incidents is 12.6 fatalities per shooting. By contrast, the average death toll for the 94 incidents in which it is known assault weapons were not used (which resulted in 732 fatalities) is 7.8 fatalities per shooting (Table 6). Of the 182 mass public shootings in the last 50 years in which the type of firearm used is known, 55 involved assault weapons, resulting in 555 deaths. The average death toll for these 55 incidents is 10.1 fatalities per shooting. By contrast, the average death toll for the 127 incidents in which it is known assault weapons were not used (which resulted in 761 fatalities) is 6.0 fatalities per shooting (Table 7). In other words, in the last 50 years, the use of assault weapons in high-fatality mass shootings and mass public shootings has resulted, respectively, in 62% and 68% increases in average fatalities per incident (Tables 5 and 6). In the last 10 years, the differences in average fatality rates per incident are even more pronounced—more than double: 7.5 versus 15.6 deaths per high-fatality mass shooting and 6.0 versus 12.3 deaths per mass public shooting. These amount, respectively, to 108% and 105% increases in the average death tolls associated with the use of assault weapons (Tables 6 and 7).

50. This review of the data suggests that assault weapons are force multipliers when used to perpetrate mass shootings.

**Table 6. The Average Death Tolls Associated with the Use of Assault Weapons in High-Fatality Mass Shootings in the U.S., 1974-2023**

	<b>Average Death Toll for Incidents That Did Not Involve the Use of Assault Weapons</b>	<b>Average Death Toll for Incidents That Did Involve the Use of Assault Weapons</b>	<b>Percent Increase in Average Death Toll Associated with the Use of Assault Weapons</b>
<b>Last 50 Years</b>	7.8 Deaths	12.6 Deaths	62%
<b>Last 10 Years</b>	7.5 Deaths	15.6 Deaths	108%

Note: The calculations in Table 6 exclude three high-fatality mass shootings (3/15/2020, Moncure, NC, six deaths; 9/7/2020, Aguanga, CA, seven deaths; and 1/16/2023, Goshen, CA, six deaths) in which the firearms used are unknown.

**Table 7. The Average Death Tolls Associated with the Use of Assault Weapons in Mass Public Shootings in the U.S., 1974-2023**

	<b>Average Death Toll for Incidents That Did Not Involve the Use of Assault Weapons</b>	<b>Average Death Toll for Incidents That Did Involve the Use of Assault Weapons</b>	<b>Percent Increase in Average Death Toll Associated with the Use of Assault Weapons</b>
<b>Last 50 Years</b>	6.0 Deaths	10.1 Deaths	68%
<b>Last 10 Years</b>	6.0 Deaths	12.3 Deaths	105%

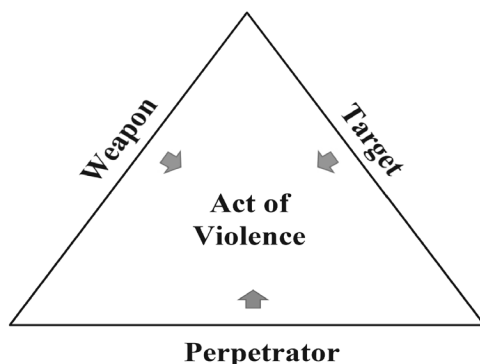
Note: The calculations in Table 7 exclude one mass public shooting (2/6/17, Yazoo City, MS, four deaths) in which the firearms used are unknown.

**IVAiv. Restrictions on Assault Weapons and LCMs Reduce the Incidence of Gun Massacres, Resulting in Lives Saved.**

51. As conceptualized in the Trinity of Violence model that I developed in my book on mass shootings, every act of violence involves three elements: a perpetrator, a weapon, and a target

(Figure 19).<sup>48</sup> The key to mitigating violence is to “break the trinity” by hindering at least one of the three elements. This is accomplished by dissuading the potential offender(s), denying the potential instrument(s) of violence, or defending the potential victim(s).<sup>49</sup>

**Figure 19. The Trinity of Violence**



52. Bans are law-based concepts that prohibit certain behaviors by criminalizing them.<sup>50</sup> Bans on assault weapons generally make it illegal to manufacture, import, transfer, own, or possess certain firearms. Bans work in relation to two of the three elements of the Trinity of Violence: dissuasion and denial. With regard to perpetrators, bans use the threat of criminal penalty to *deter potential offenders* from engaging in the prohibited behavior. In the case of bans on assault weapons, they threaten conviction, imprisonment, and/or fines should an individual manufacture, import, transfer, or possess a prohibited assault weapon. One mechanism at work here centers around dissuading potential shooters from trying to build or otherwise acquire banned firearm technologies. But another mechanism at work focuses on the assault weapon itself: *deprive potential instruments of violence*. Knowing that someone who is willing to commit murder might not be deterred from violating another criminal law, like possessing a prohibited item, bans also threaten punishment against anyone who tries to transfer (through sale, gift, or loan) a restricted

<sup>48</sup> Klarevas, *supra* note 1, at 27–29, 229–238.

<sup>49</sup> *Id.*

<sup>50</sup> Philip J. Cook, “Research in Criminal Deterrence: Laying the Groundwork for the Second Decade,” 2 *Crime and Justice* 211 (1980); and Daniel S. Nagin, “Deterrence in the Twenty-First Century,” 42 *Crime and Justice* 199 (2013).

item to someone who is prohibited from acquiring it. In essence, the former strategy seeks to dissuade the offenders and the latter strategy seeks to deny the instruments of violence.

53. Ideally, someone intent on committing a mass shooting with an assault weapon would be dissuaded from going on a rampage by the fact that their means of choice are not available. In such a scenario, the attack would be quashed. This *suppression effect* is akin to what economists and psychologists refer to as a positive spillover effect, where one desirable outcome produces a second, loosely-related desirable outcome.<sup>51</sup> A real-world example of this is the so-called “Matrix Killings,” where a 19-year-old Virginia man blamed *The Matrix* film for driving him to murder his parents with a shotgun. At the time of the crime in 2003, the Federal Assault Weapons Ban was in effect, preventing him from obtaining an assault rifle. In a 2013 jailhouse interview, he told CNN, “If I had an assault weapon, things would have been much worse.” He added that had he had an AR-15 instead of a shotgun, he is positive that, after killing his parents, he would have gone on a rampage and “killed as many people as I possibly could.” As he noted, “because I didn’t have an assault weapon, that didn’t happen.”<sup>52</sup> In this case, the unavailability of an assault weapon due to the federal ban appears to have suppressed the perpetrator’s impulse to commit a mass shooting.

54. Of course, some potential mass shooters will not be discouraged from going on a killing spree just because their means of choice are unavailable. They will instead replace their desired instruments of violence with available alternatives. This is commonly referred to as the *substitution effect*, wherein an act of violence is still perpetrated, but with a different, less lethal instrument of violence.<sup>53</sup> A real-world example of the substitution effect at work is the 2019 synagogue rampage in Poway, California. In that attack, the gunman appears to have been unable

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<sup>51</sup> Paul Dolan and Mateo M. Galizzi, “Like Ripples on a Pond: Behavioral Spillovers and Their Implications for Research and Policy,” 47 *Journal of Economic Psychology* 1 (2015); K. Jane Muir and Jessica Keim-Malpass, “Analyzing the Concept of Spillover Effects for Expanded Inclusion in Health Economics Research,” 9 *Journal of Comparative Effectiveness Research* 755 (2020).

<sup>52</sup> “Inside the Mind of a Killer,” CNN (Transcripts), August 23, 2013, available at <https://transcripts.cnn.com/show/pmt/date/2013-08-23/segment/01>.

<sup>53</sup> Philip J. Cook, “The Effect of Gun Availability on Violent Crime Patterns,” 455 *Annals of the American Academy of Political and Social Science* 63 (1981); and Anthony A. Braga et al., “Firearm Instrumentality: Do Guns Make Violent Situations More Lethal?” 4 *Annual Review of Criminology* 147 (2021).

to acquire an assault rifle and large-capacity magazines due to California's ban on both. Instead, he acquired what is known as a California-compliant semiautomatic rifle (which lacked features such as a pistol grip and a forward hand grip) and 10-round magazines. As a result, the gunman quickly ran out of bullets, and while pausing to reload—which appears to have been extremely difficult given that he did not have assault weapon features on his rifle that facilitated fast reloading—a congregant chased him away, preventing him from continuing his attack.<sup>54</sup> In this incident, which resulted in one death, California's ban on assault weapons and large-capacity magazines worked exactly as intended. It deprived the active shooter of the mechanisms that might have allowed him to kill enough people to surpass the fatality threshold of a mass shooting. Stated differently, if you examine data sets that identify shootings resulting in mass murder, you will not find the Poway synagogue attack on their lists.

55. It might seem perverse to think that restrictions on certain instruments of violence operate on the premise that, if an act of violence cannot be averted, then it will proceed with an alternative instrument. Nevertheless, this is exactly how bans on assault weapons operate in theory. They suppress the inclinations of potential mass shooters to go on killing rampages in the first place because their means of choice are unavailable. And, should dissuasion fail, bans force perpetrators to substitute less lethal instruments for more dangerous, prohibited ones, reducing the casualty tolls of attacks when they do occur.

56. In light of the growing threat posed by mass shootings, legislatures have enacted restrictions on assault weapons in an effort to reduce the occurrence and lethality of such acts of firearm violence. Prominent among these measures was the 1994 Federal Assault Weapons Ban. In September 1994, moved to action by high-profile shooting rampages that occurred the previous year at a San Francisco law firm and on a Long Island Rail Road commuter train, the U.S. Congress

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<sup>54</sup> Elliot Spagat and Julie Watson, "Synagogue Shooter Struggled with Gun, Fled with 50 Bullets," Associated Press, April 30, 2019, available at <https://apnews.com/article/shootings-north-america-us-news-ap-top-news-ca-state-wire-8417378d6b934a8f94e1ea63fd7c0aea>.

enacted a ban on assault weapons (as well as large-capacity magazines) that applied to all 50 states plus the District of Columbia, bringing the entire country under the ban.<sup>55</sup>

57. Like the state bans on assault weapons that were implemented before it, the federal ban was aimed primarily at reducing mass shooting violence—an objective the ban sought to achieve by prohibiting the manufacture, importation, possession, and transfer of assault weapons and large-capacity magazines not legally owned by civilians prior to the date of the law’s effect (September 13, 1994).<sup>56</sup> Congress, however, inserted a sunset provision in the law which allowed the federal ban to expire in exactly 10 years, if it was not renewed beforehand. As Congress ultimately chose not to renew the law, the federal ban expired on September 13, 2004. In the aftermath of the federal ban’s expiration, mass shooting violence in the United States increased substantially.<sup>57</sup>

58. The legislative intent of the State of New York in enacting the laws being challenged in the present case is similar to that of other legislative bodies that have restricted assault weapons: reducing gun violence, especially the frequency and lethality of mass shootings. Because, on average, the use of assault weapons results in higher death tolls in mass shootings, the rationale for imposing restrictions on assault weapons is to reduce the loss of life associated with the increased kill potential of such firearm technologies.

59. Currently, 32% of the U.S. population is subject to a ban on assault weapons. The following is a list of the 11 state-level jurisdictions that presently restrict assault weapons: California (January 1, 1990); New Jersey (September 1, 1990); Hawaii (July 1, 1992, assault pistols only); Connecticut (October 1, 1993); Maryland (June 1, 1994, initially assault pistols but expanded to long guns October 1, 2013); Massachusetts (July 23, 1998); New York (November 1, 2000); the District of Columbia (March 31, 2009); Delaware (June 20, 2022); Illinois (January 10,

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<sup>55</sup> Pub. L. No. 103-322, tit. XI, subtit. A, 108 Stat. 1796, 1996-2010 (codified as former 18 U.S.C. § 922(v), (w)(1) (1994)).

<sup>56</sup> Christopher Ingraham, “The Real Reason Congress Banned Assault Weapons in 1994—and Why It Worked,” *Washington Post*, February 22, 2018, available at <https://www.washingtonpost.com/news/work/wp/2018/02/22/the-real-reason-congress-banned-assault-weapons-in-1994-and-why-it-worked/>.

<sup>57</sup> See sources cited *supra* note 50.



2023); and Washington (April 25, 2023)).<sup>58</sup> As a reminder, from September 13, 1994 through September 12, 2004, the entire country was also subject to federal ban on assault weapons.

60. In the field of epidemiology, a common method for assessing the impact of laws and policies is to measure the rate of onset of new cases of an event, comparing the rate when and where the laws and policies were in effect against the rate when and where the laws and policies were not in effect. This measure, known as the incidence rate, allows public health experts to identify discernable differences, while accounting for variations in the population, over a set period of time. Relevant to the present case, calculating incidence rates across states, in a manner that captures whether or not bans on assault weapons were in effect during the period of observation, allows for the assessment of the effectiveness of such bans. In addition, fatality rates—the number of deaths, per population, that result from particular events across different jurisdictions—also provide insights into the impact bans on assault weapons have on mass shooting violence.<sup>59</sup>

61. Since January 1, 1990, when the first state ban on assault weapons took effect, through December 31, 2023, there have been 103 high-fatality mass shootings and 154 mass public shootings in the United States (**Exhibits B and C**).<sup>60</sup> Calculating incidence and fatality rates for this time-period, across jurisdictions with and without bans on assault weapons, reveals that states that prohibited assault weapons experienced 45% and 18% decreases, respectively, in the high-fatality mass shooting and mass public shooting incidence rates. They also experienced 53% and 37% decreases, respectively, in the high-fatality mass shooting and mass public shooting fatality rates, regardless of the weaponry used by the mass murderers (Tables 8-9).<sup>61</sup>

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<sup>58</sup> The dates in parentheses mark the effective dates on which the listed states became subject to bans on assault weapons.

<sup>59</sup> For purposes of this declaration, incidence and fatality rates are calculated using methods and principles endorsed by the Centers for Disease Control. See Centers for Disease Control and Prevention, *Principles of Epidemiology in Public Health Practice: An Introduction to Applied Epidemiology and Biostatistics* (2012), available at <https://stacks.cdc.gov/view/cdc/13178>.

<sup>60</sup> There were no state bans on assault weapons in effect prior to January 1, 1990. Therefore, January 1, 1990, is the logical starting point for an analysis of the impact of assault weapons bans. See, Klarevas et al., *supra* note 2.

<sup>61</sup> For purposes of coding, between September 13, 1994, and September 12, 2004, the federal assault weapons ban was in effect. During that 10-year period, all 50 states and the District of Columbia were under legal conditions that prohibited assault weapons. As such, the entire country is coded as being under an assault weapons ban during the timeframe that the federal assault weapons ban was in effect.

62. When calculations go a step further and are limited to mass shootings involving assault weapons, the difference between the two jurisdictions (non-ban states and ban states) is even more pronounced. In the time-period between January 1, 1990, and December 31, 2023, accounting for population, states with assault weapons bans in place experienced 60% fewer high-fatality mass shootings involving the use of assault weapons and 40% fewer mass public shootings involving the use of assault weapons. Similarly, jurisdictions with bans in effect experienced 67% fewer deaths resulting from high-fatality mass shootings perpetrated with assault weapons and 58% fewer deaths resulting from mass public shootings perpetrated with assault weapons (Tables 8-9).

63. All of the above calculations lead to the same conclusion: when bans on assault weapons are in effect, per capita, fewer mass shootings occur and fewer people die in such shootings—especially incidents involving assault weapons, where the impact is most striking.

64. The main purpose of bans on assault weapons is to restrict the availability of assault weapons. The rationale is that, if there are fewer assault weapons in circulation, then potential mass shooters will either be dissuaded from attacking or they will be forced to use less-lethal firearm technologies, resulting in fewer lives lost. The epidemiological data lend support to the policy choices of the State of New York that seek to enhance public safety through restrictions on civilian access to certain firearms. While imposing constraints on assault weapons will not prevent every mass shooting, the data suggest that legislative efforts to restrict such instruments of violence should result in lives being saved.

**Table 8. Incidence and Fatality Rates for High-Fatality Mass Shootings, by Whether or Not Assault Weapons (“AW”) Bans Were in Effect, 1990-2023**

	Annual Average Population (Millions)	Total Incidents	Annual Incidents per 100 Million Population	Total Deaths	Annual Deaths per 100 Million Population
All High-Fatality Mass Shootings					
Non-AW Ban States	161.2	70	1.28	721	13.15
AW Ban States	136.2	33	0.71	288	6.22
Percentage Decrease in Rate for AW Ban States			45%		53%
High-Fatality Mass Shootings Involving Assault Weapons					
Non-AW Ban States	161.2	26	0.47	365	6.66
AW Ban States	136.2	9	0.19	103	2.22
Percentage Decrease in Rate for AW Ban States			60%		67%

Note: Population data are from U.S. Census Bureau, “Population and Housing Unit Estimates Datasets,” available at <https://www.census.gov/programs-surveys/popest/data/data-sets.html>.

**Table 9. Incidence and Fatality Rates for Mass Public Shootings, by Whether or Not Assault Weapons (“AW”) Bans Were in Effect, 1990-2023**

	Annual Average Population (Millions)	Total Incidents	Annual Incidents per 100 Million Population	Total Deaths	Annual Deaths per 100 Million Population
All Mass Public Shootings					
Non-AW Ban States	161.2	91	1.66	744	13.57
AW Ban States	136.2	63	1.36	393	8.49
Percentage Decrease in Rate for AW Ban States			18%		37%
Mass Public Shootings Involving Assault Weapons					
Non-AW Ban States	161.2	32	0.58	367	6.69
AW Ban States	136.2	16	0.35	130	2.81
Percentage Decrease in Rate for AW Ban States			40%		58%

Note: Population data are from U.S. Census Bureau, “Population and Housing Unit Estimates Datasets,” available at <https://www.census.gov/programs-surveys/popest/data/data-sets.html>.

#### ***IVB. Defensive Gun Uses***

65. There is very little systematically-collected evidence pertaining to defensive gun uses (DGUs) involving LCMs or assault weapons. The two main sources are the English survey and FBI reports on active shooter events in the United States.

#### **VBi. The English Survey.**

66. The English survey asked respondents to indicate whether they have ever been involved in a DGU: “Have you ever defended yourself or your property with a firearm, even if it was not fired or displayed? Please do not include military service, police work, or work as a security guard.” Overall, the survey found that 4,654 respondents (out of 15,258 qualifying

respondents) indicated that they had engaged in a combined 9,077 DGUs.<sup>62</sup> As a percentage, 31% of the qualifying survey pool had engaged in at least one DGU. In terms of the nature of the DGU, 51% involved brandishing a gun, 18% involved firing a gun, and 31% involved “neither” (which appears to be a category created to capture DGUs that implied that the defender possessed a gun without a physical use of the gun).<sup>63</sup> The English survey found that 66% of DGUs involved a handgun, 21% involved a rifle (this would include, but not be limited to, AR-15-style rifles), and 13% involved a shotgun. The vast majority of DGUs, 79%, occurred on the defender’s property, with over two-thirds of DGUs on the defender’s property occurring outside the home and just under one-third occurring inside the home. The remaining 21% of DGUs breakdown as follows: 9% in public, 5% on someone else’s property (either outside or inside someone else’s home), 3% at work, and 4% at a location broadly classified as some “other” location. In terms of a pattern, most gun owners appear to have never engaged in a DGU. However, for those who indicated that they had engaged in at least one DGU, it appears that most common type of DGU occurred on one’s property and involved the brandishing of a handgun.<sup>64</sup>

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<sup>62</sup> To identify the 15,258 qualified number of respondents for inclusion in the analysis of reported DGUs, respondents were first screened to make sure that they had identified themselves as gun owners who completed the survey and answered the screening question toward the end of the survey with “none of the above” as prompted by the questionnaire. This resulted in 15,271 total respondents. From this group, 13 respondents, who did not answer the question of how many DGUs they had engaged in, were excluded, bring the final qualifying group to 15,258 respondents. All the survey data on DGUs came from the publicly available data set that Professor English uploaded to the Harvard Dataverse, *supra* note 11.

<sup>63</sup> The “neither” option in the survey was worded as follows: “Neither (for example, you verbally told someone you had a gun and that was sufficient).” If “neither” responses are excluded on grounds that they did not physically involve the use of firearm, the overall number of DGUs is reduced by 31%.

<sup>64</sup> There are numerous studies that call into question the veracity and/or accuracy of self-reported DGUs. See, for example, David Hemenway, “Survey Research and Self-Defense Gun Use: An Explanation of Extreme Overestimates,” 87 *Journal of Criminal Law and Criminology* 1430 (1997); David Hemenway, “The Myth of Millions of Annual Self-Defense Gun Uses: A Case Study of Survey Overestimates of Rare Events,” 10 *Chance* 6 (1997); Philip J. Cook, Jens Ludwig, and David Hemenway, “The Gun Debate’s New Mythical Number: How Many Defensive Uses Per Year? 16 *Journal of Policy Analysis and Management* 463 (1997); John P. May et al., “Medical Care Solicitation by Criminals with Gunshot Wound Injuries: A Survey of Washington D.C. Jail Detainees,” 48 *Journal of Trauma* 130 (2000); and John P. May and David Hemenway, “Do Criminals Go to the Hospital When They are Shot?” 8 *Injury Prevention* 236 (2002). One study, in particular, had five criminal court judges assess the self-reported accounts provided by gun owners who felt that they were engaging in a legitimate DGU and a majority of the judges, after assuming that the armed defenders had a permit authorizing them to carry a concealed weapon, concluded that the majority of accounts were illegal uses of a firearm. David Hemenway, Matthew Miller, and Deborah Azrael, “Gun Use in the United States: Results from Two National Surveys, 6 *Injury Prevention* 263 (2000).

67. Because the survey asked participants to identify whether or not they had ever owned AR-15-style rifles, it is possible to compare these respondents with respondents who never owned AR-15-style rifles. One clear pattern that stands out is that respondents who indicated that they have owned AR-15-style rifles have engaged in far more DGUs than respondents who indicated that they have never owned such rifles. Those who have owned AR-15-style rifles made up 30% of the qualifying survey pool, yet they accounted for 50% of gun owners who had engaged in a DGU. Furthermore, while most DGUs for both categories of respondents (those who have and have not owned AR-15-style rifles) have been instances where a firearm was brandished (51% for both groups), by a margin of nearly two-to-one, owners of AR-15-style rifles discharged their firearms in DGUs more often than respondents who never owned an AR-15-style rifle.

68. Two other patterns—both similarities—also emerge from a review of the survey data. Most DGUs occurred on the defender's property and most DGUs involved a handgun. Only 16% of DGUs involving respondents who never owned an AR-15-style rifle involved a rifle (of any type). For respondents who have owned an AR-15-style rifle, 25% of DGUs involved a rifle (of any type). While the latter percentage is larger than the former percentage, the data still indicate that handguns are the preferred weapon for purposes of defense—for those who have never owned AR-15-style rifles (using handguns in 70% of their DGUs) as well as those who have owned AR-15-style rifles (using handguns in 63% of their DGUs).<sup>65</sup>

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<sup>65</sup> Another fascinating distinction between those who owned AR-15-style rifles and those who have never owned AR-15-style rifles involves the likelihood of being engaged in five or more DGUs. Owners of AR-15-style rifles made up 30% of the survey pool, but they accounted for 62% of the respondents who had engaged in five or more DGUs in their lifetimes. The majority of these for both groups involved handguns, not rifles, although, again, those who indicated that they have owned AR-15-style rifles discharged their firearms in DGUs at a rate that was double that of those who indicated that they have never owned AR-15-style rifles. One unexpected finding relates to the age of owners of AR-15-style rifles who have engaged in five or more DGUs. Intuitively, one would expect that the most likely gun owners to have engaged in five or more DGUs in their lifetimes would be those in the older demographic half (over 50 years of age). However, for both those who have owned AR-15-style rifles as well as those who have never owned AR-15-style rifles, those adults 50 years of age and under account for over half of the respondents who indicated that they have engaged in five or more DGUs. But more striking, while those adults 50 and under who never owned an AR-15-style rifle accounted for 55% of non-AR-15 owners who had engaged in five or more DGUs, adult owners of AR-15-style rifles 50 and under accounted for 82% of all AR-15 owners who had engaged in five or more DGUs. This is a substantial difference that reflects a higher likelihood of younger AR-15 owners to become more frequently engaged in DGUs.

69. The English survey data that allow for analysis of the relationship between DGUs, on the one hand, and owners of AR-15-style rifles, on the other hand, are raw, unweighted data. It is unclear if the patterns just discussed would persist if the data were properly weighted. However, *on the assumption that these patterns would persist*, the English survey makes it clear that there is no evidence that rifles are the preferred firearm for defense of self, others, or property, not even for owners of AR-15-style rifles.<sup>66</sup> Indeed, there is no evidence whatsoever in the English survey that AR-15-style rifles are even used in DGUs.<sup>67</sup> A key takeaway from the survey, in terms of DGUs, is that handguns are the most commonly used firearms for defensive purposes.

#### **VBii. FBI Active Shooter Reports.**

70. An important question that, until now, has gone unanswered is: Are assault weapons used as frequently to stop mass shootings as they are to perpetrate them? As shown above, assault weapons have been used in over one-third of mass shootings in the past 25 years (Figures 13-14). And in the past five years, the share of mass shootings that have involved assault weapons has risen to at least half (Figures 13-14).

71. The Federal Bureau of Investigation (FBI) has been documenting active shooter incidents since 2000.<sup>68</sup> According to the FBI, active shootings are violent attacks that involve “one or more individuals actively engaged in killing or attempting to kill people in a populated area.”<sup>69</sup> A simple way to conceptualize active shooter incidents is to think of them as attempted mass

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<sup>66</sup> While not directly related to DGUs, Professor English does claim that, when assessing ownership of AR-15-style rifles, “Using survey weights based on in-survey demographics of firearms ownership has no effect on this estimate.” English, *supra* note 7, at 33. Because Professor English does not report specific weighted results, this claim cannot be properly verified.

<sup>67</sup> In all fairness, this is because the English survey did not probe what specific types of rifles were used in DGUs. However, the *Washington Post*, in its survey, found that owners of AR-15-style rifle owners also owned rifles that would not be considered AR-15-style rifles. Guskin, Tambe, and Gerberg, *supra* note 35.

<sup>68</sup> All of the information in this sub-section, including definitions and data, are publicly available from the FBI. See FBI, *Active Shooter Safety Resources*, available at <https://www.fbi.gov/how-we-can-help-you/safety-resources/active-shooter-safety-resources>.

<sup>69</sup> FBI, *Active Shooter Incidents in the United States in 2022*, April 2023, at 1, available at <https://www.fbi.gov/file-repository/active-shooter-incidents-in-the-us-2022-042623.pdf/view>. The FBI adds, “Implicit in this definition is the shooter’s use of one or more firearms. The *active* aspect of the definition inherently implies the ongoing nature of the incidents, and thus the potential for the response to affect the outcome.” *Id.* (emphasis in original). In addition to the report on incidents in 2022, the FBI has published seven other reports on active shooter incidents covering the following seven time-periods: 2000-2013, 2014-2015, 2016-2017, 2018, 2019, 2020, and 2021. All of these reports are available at the FBI’s Active Shooter Safety Resources website, *supra* note 72.



shootings. As part of its analysis of attempted mass shootings, the FBI identifies incidents that involved armed civilians using their personal firearms to intervene, regardless of whether the interventions were successful in stopping the attacks and/or neutralizing the perpetrator(s).

72. In the 23 years between January 1, 2000, and December 31, 2022, the FBI has identified 456 active shootings occurring in the United States. Out of these 456 active shooter incidents, 18 incidents (3.9%) involved defensive gun uses (DGUs) by civilians, excluding law enforcement or armed security.<sup>70</sup> Of these 18 DGUs, the firearm used by an armed private citizen intervening was identifiable in 17 incidents; 14 involved handguns and the remaining three involved long guns (one shotgun, one bolt-action rifle, and one rifle that would qualify as an assault weapon).<sup>71</sup> In other words, out of the 17 incidents where an armed civilian intervened and it was possible to identify the DGU firearm, only one incident (5.9%) involved an assault weapon.<sup>72</sup> Within the broader context of all active shooter incidents, only one incident out of 456 in the past 23 years (0.2%) is known to have involved an armed civilian intervening with an assault weapon.<sup>73</sup>

#### ***IVC. Summary***

73. As shown above, while assault weapons are used to perpetrate violent crime, particularly the murder of police officers, their most prominent criminal use appears to be to

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<sup>70</sup> In 17 of the 18 DGU-involved active shooter incidents, there was an exchange of gunfire. For the one incident that did not involve an exchange of gunfire, the gun (a handgun) was in the possession of a person who helped to detain the active shooter after the shooting had ceased. FBI, *supra* notes 72 and 73.

<sup>71</sup> All 14 DGU incidents that involved handguns also involved armed civilians who held valid concealed-carry permits or were legally carrying their handguns. *Id.* In 12 of these 14 incidents, details about the types of handguns used in self-defense were available in news media accounts or in news media photographs from the crime scene. In two of the 14 incidents, the use of concealed handguns was inferred based on details about the shooting reported in news media accounts. There is no evidence that either of these two DGU incidents involved an assault pistol.

<sup>72</sup> The FBI also identifies an incident in which an armed individual (a local firefighter) subdued and detained a school shooter, but there is no evidence that the armed firefighter drew his handgun during the incident. *Id.* Moreover, local authorities have refused to comment on whether the firefighter ever drew his handgun. See Carla Field, “Firefighter Was Armed During Takedown of Shooting Suspect, Sheriff Says,” WYFF, October 3, 2016, available at <https://www.wyff4.com/article/firefighter-was-armed-during-takedown-of-shooting-suspect-sheriff-says/7147424>. Adding this incident to the 17 DGU-involved incidents where the type of firearm was identifiable would mean that 5.6% (as opposed to 5.9%) of the active shooter incidents, where an armed civilian intervened, involved an assault weapon.

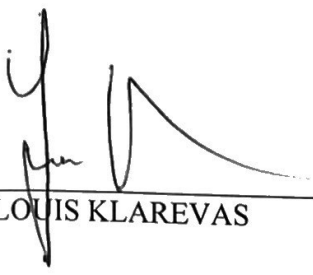
<sup>73</sup> FBI, *supra* notes 72 and 73. The one DGU that involved an assault weapon was the 2017 church massacre in Sutherland Springs, Texas. In that incident, an armed private citizen used an AR-15-style rifle to wound the perpetrator as he was attempting to flee the scene. While the perpetrator was still able to flee the scene despite being shot, minutes later, he crashed his vehicle trying to escape and then took his life with his own firearm before law enforcement could apprehend him. See Adam Roberts, “Man Who Shot Texas Gunman Shares His Story,” KHBS/KHOG, November 7, 2017, available at <https://www.4029tv.com/article/man-who-shot-texas-church-gunman-shares-his-story/13437943>.



perpetrate multiple-victim shootings. Mass shootings resulting in double-digit fatalities are relatively modern phenomena in American history, related to the use of assault weapons and large-capacity magazines. In the present era, mass shootings pose a significant—and growing—threat to American public safety. In particular, mass shootings involving assault weapons, on average, have resulted in a substantially larger loss of life than similar incidents that did not involve assault weapons. Most mass shootings now involve assault weapons, which serve as force multipliers associated with higher average death tolls when used. Relatedly, jurisdictions that restrict assault weapons experience fewer mass shooting incidents and fatalities, per capita, than jurisdictions that do not restrict assault weapons. Comparing offensive to defensive uses shows that assault weapons are used by civilians with a far greater frequency to perpetrate mass shootings than to stop mass shootings. Indeed, in terms of defensive gun uses, in general, the quintessential firearm used by the majority of gun owners appears to be the handgun. This may even be the case for owners of AR-15-style rifles, who appear to use handguns, not rifles, in the majority of their defensive gun uses.

I, Louis Klarevas, declare pursuant to 28 U.S.C. § 1746 and under penalty of perjury under the laws of the United States of America that the foregoing is true and correct to the best of my knowledge, information, and belief.

Executed on May 14, 2024, at Nassau County, New York



LOUIS KLAREVAS